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THE VETERINARY JOURNAL

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JANUARY, 1936.

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(*Article by* Dr. W. Hinz.)

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Veterinary Adviser to various Overseas Governments; late Chief Veterinary Officer to the Corporation of the City of London

JANUARY, 1936

KING GEORGE V.

ALTHOUGH it was known for some time that the general health of His Majesty had not been good, it came as a terrible shock to the nation when the announcement was made that things had taken a very serious turn, and that the end was near. To us, as members of a sporting profession, the loss seems of a personal nature, for His late Majesty was a true sportsman in every sense of the term. One of the last visits which he made before becoming ill was to the loose-boxes which contained some of his favourite horses. The practical bond of sympathy with which our Royal Family assist good and genuine work has been shown on every possible opportunity, and our profession had evidence of this on the occasion on which not only was £100 personally subscribed from the privy purse towards the Building and Endowment Fund of the Royal Veterinary College, but a characteristically charming and practical letter was sent with it; permission, too, being granted that it might be published as an encouragement to others to give their support too. The whole country mourns, not merely for a King, but for a humane man, to save whom each and every one of his subjects would gladly have laid down their lives.

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Editorial

THE INCREASED EDITORIAL STAFF.

As stated in the December issue, it is thirty years since the present arrangement of the Editorship of THE VETERINARY JOURNAL was initiated, and the time has now come when others must help in the responsibility of carrying on the work.

With this intention the Publishers have made arrangements whereby the present Editorial Staff shall have the added support of Professors McCunn and Miller, Lieut.-Colonel Dunlop Young, Dr. Amoroso, and Mr. Richard Hudson. A stronger combination it would be difficult to find, as the collaborators include men of reputation in each branch of veterinary life—practitioner, public health and collegiate. Beyond a brief introduction, we have no need to do other than to present their names to our readers.

Dr. E. C. Amoroso, whose name is at present perhaps the least known to practitioners, is the Lecturer in Histology at the London Veterinary College. We are promised several interesting series of articles in the near future from his facile pen. From Richard Hudson we expect our clinical knowledge to become enriched from his careful observations of animals in practice: cases described in clear language and in such a way that to the student who reads them all difficulties in diagnosis appear to vanish completely.

The names of Professors McCunn and Miller are household words in the profession, and each has already started to build up his contribution list of material of interest to the practitioner—for whom this Journal has always desired to cater.

Last, although by no means least in the list, comes Lieut.-Colonel T. Dunlop Young, whose present position as Veterinary Adviser to the New Zealand, Canadian, South African and Southern Rhodesian Governments, and whose life-long appointment as Chief Veterinary Officer to the Corporation of the City of London (which included the Smithfield Meat Market), renders him an ideal collaborator on the Public Health side.

With these added pillars to the Editorial Staff, the readers of the oldest British veterinary journal in the world can rest assured that their varied and respective tastes will be well catered for. We trust that our readers will also play their part and not forget that the old proverb—"an ounce of help is worth a pound of pity"—can be quite conveniently adapted to a request from the Editorial chair for support in regard to clinical contributions and opinions.

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General Articles

CONTRIBUTION TO THE OPERATIVE TREATMENT OF OTITIS EXTERNA VERRUCOSA OF THE DOG.

By Dr. W. HINZ,

Professor of Canine Medicine and Surgery, the University Veterinary School, Berlin.

One of the most troublesome maladies of the external auditory duct of the dog for the veterinary practitioner to deal with satisfactorily, consists of that form of otitis externa in which a more or less complete closure of the external duct has been caused either by chronic indurative processes arising from the sides, or by the formation of warts, which have the appearance of polypus-like exuberances; for through these causes the ear-wax, or the secretion that has formed in advanced cases, is retained. Owing to the swelling of the lining membrane of the duct, or from existing excrescences, it is very difficult to clear it out thoroughly, and it has a macerating effect on the skin of the hearing duct, with which it is in continuous contact. It also causes inflammation by the decomposition and accumulation of débris. In advanced cases it generally becomes an otitis externa suppurativa profunda with ulcers, causing the treatment to be more troublesome than ever because of the inaccessibility of the focus of the inflammation. Another inconvenience is that the affected animals scrape and chafe their ears to allay the itching, and in that way secondary irritations are provoked and continue, which frequently heal imperfectly. Considering the failure and inefficiency of medicinal agents, endeavours have been repeatedly made to discover a successful operative treatment of such cases.

Hertwig (1853[1]) said: If the swelling of the sides of the auditory duct causes their contact, and if thereby is induced any irritation, the hearing duct sometimes grows entirely together. In this state you cannot reach the bottom, not even by means of a probe, and the dog becomes entirely deaf on the diseased ear. As an experiment you may perform a small crucial incision into the fleshy exuberance, so that the centre of the incision is over the middle of the hearing duct; then you may press a probe with some force into the centre of the wound and put a small tampon into the canal formed in this way.

In obstinate cases Hoffman[2] has intersected the hearing duct towards the bottom and the hind part, and then applied a small draining tube; afterwards daily dressing the wound with medicaments after having cleaned it carefully.

Hébrant and Antoine[3] incise the whole shell-like part of the ear-cartilage as well as the inner partitions of the external ear—just as at the entrance to the

hearing duct—with a circular incision and cut out the hypertrophied tissue, but leave the exterior skin intact.

Heusser[4] shaves under local anæsthesia or general narcosis below the ear and incises the skin after having introduced a probe, splitting the subcutis, the parotis and the auditory duct itself up to its inner, osseous part. After having checked the hæmorrhage, it is easy to survey the hearing duct and to get it clear. In order to fix a tampon in the cavity of the wound some button-like sutures are put on, which are removed with the tampon after two or three days. Afterwards the treatment is that of an open wound.

Berge[5] also enlarged eventually the auricle as well as the hearing duct by operation. The exterior ear is cleaned and the hearing duct is greased with borax ointment in order to avoid the adherence of coagulated blood. Then the hairs round about are shaved, the skin is cleaned and disinfected with tincture of iodine. Local anæsthesia is effected by the infiltration of the subcutis, the muscular system and the perichondrium with a solution of 2 per cent. of novocaine with adrenalin. The direction of the incision depends on the situation of the ulcers. As a rule it is necessary to section the exterior skin, the muscular system and the muscular cartilage from the beginning of the incision up to the entrance of the ear duct. If the ulcerations are at the entrance or in the duct itself it is requisite to split as far as necessary the cartilaginous ear duct. If the ulcerations are situated between and on the wrinkles which are situated caudally to the incision, then the incision must be made approximately parallel to the folds from the antitragus down to the bottom of the auricle. The incision must be executed very cautiously because of the numerous vessels, in order to avoid the bleeding into the hearing duct. The bigger vessels are therefore picked up between forceps, ligatured and then intersected. If the auricle and eventually the ear-duct have been split in this way down to the requisite depth, the larger ulcerations may be excised. The bleeding is staunched by means of a thermo-cauteriser. The wound of the operation is now covered with iodoform gauze, the auricle furnished with tampons, and then a well-fitting bandage is put on.

The operative treatment of otitis externa has been performed by Srnetz[6] when large exuberances prevented the mechanical cleaning of the hearing duct. At the outside of the ear, in ventral direction from the place where the fore and back lips of the auricle converge, the skin is shaved and disinfected. In order to perform the operation in a painless way a subcutaneous local anæsthetic is used. The knife is introduced into the ear duct, which is fissured towards the outside. The fissure ought to be effected so far that all the ulcers and exuberances of the ear duct are easily accessible to the further treatment. The wound that is situated nearly vertically ought to be longer at the outside of the ear than at the side which is adjacent to the ear duct, so that the discharge of the wound can drain efficiently. The exuberances are immediately cleared off by means of a pair of bent scissors or a sharp spoon. The bleeding, which is

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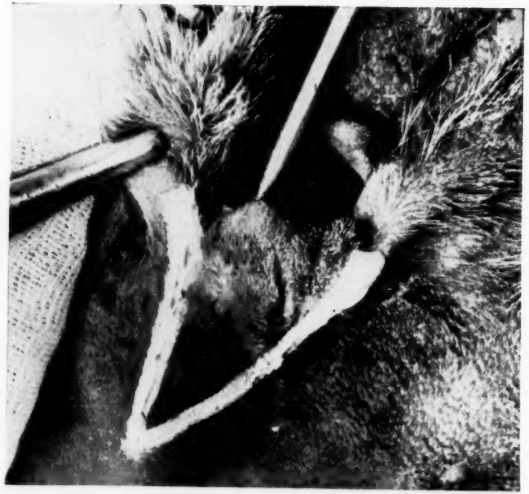

FIG. 1.—The operation field is marked and the probe is introduced.

FIG. 2.—The triangular outer limitation of the external ear-duct is cleared away.

(*Article by* Dr. W. Hinz, *page* 3)

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FIG. 3.—Photograph of the operation. The warty sides of the external orifice can be distinctly recognized. The triangular piece is dissected up to the top of the ear-duct, seized by the forceps, and twisted vertically upwards. The incision is distinctly shown, and above the entrance of the aural orifice there is a large wart.

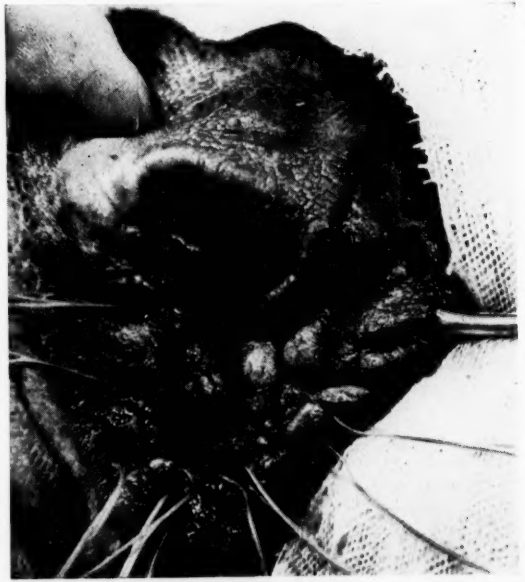

FIG. 4.—The triangular piece is removed, the wounds are sutured, and above the entrance to the opened orifice there has formed a bigger warty exuberance.

(*Article by* Dr. W. Hinz, *page* 3)

sometimes considerable, is staunched either by a ligature or by a compression, or by a cautery. The fissured hearing duct is filled up carefully with tampons. A fixed bandage similar to the dressing used for the clipping of the ears is applied for twenty-four hours. After taking off the bandage, Srnetz has treated the otitis proper first with ointment, later on in a dry way (dry cleaning three or four times a day). The operation wound usually heals within a month. In all the cases a change for the better, but not complete cure, has been achieved.

For some years I also treated the disease surgically, and have proceeded first of all in the following way: I performed the operation partly under local anæsthesia, partly under general narcosis, after the place of operation had been prepared by shaving and disinfecting. I then introduced a button probe into the auditory duct in order to fix its direction, and fissured the external hearing duct from the upper lip of the tragus through the cuirass cartilage up to its proximity to the osseous hearing duct. The incision was started at the front or back lip (in the incisura tragica of the upper lip) of the tragus. A corresponding second incision was made after this through the inner sides of the ear duct, the ear cartilage, muscular system of the skin, subcutis and epidermis from the upper and posterior part of front lip of the tragus, so that the two incisions converged at the deepest place of the outer hearing duct. By this procedure a triangular piece of the outer hearing duct is removed whose base represents the upper lip of the tragus, the tip of the triangle is situated at the beginning of the osseous hearing duct. The pictures 1 and 2 illustrate the lines of the incisions.

After this operation the whole of the hearing duct is accessible to the further surgical treatment for the removal of the exuberances, which can be performed in pharmacological, electro-acoustical or surgical way after having stanched the bleeding of the vessels. I let the healing proceed *per secundam* under bandage. After six or eight weeks the animals can leave the clinic. By this time wounds of the operation are healed. Now the hearing duct remains open because of the removal of the triangular piece, and is accessible at any time for further treatments. Any relapses, however, have not been observed. Disfigurations did not occur. In dogs with hanging ears, such as dachshunds, poodles, hounds and so on, the natural carriage of the ear covered the defect. In dogs with standing ears and with short hairs, the hairs which had grown again did the same to such an extent that the attention of the observer had to be called to the operation before the different formation of the ear duct could be noticed.

After I had performed this operation for several years with great success I modified it in order to shorten the long time of the cure.

The operation was carried out as mentioned above, under narcosis. After having stanched bleeding of the vessels I sewed the two operation wounds. I joined the outer skin with the interior skin of the ear duct in such a way that the cut edges of cartilage were covered by the outer skin. In most cases I could

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do without ligaturing the intersected vessels, as they were cut off following the union of the wounds by the suture, and bleeding was stopped. The pictures 3 and 4 show an operation of this kind before and after the suture.

Throughout a well-dressed ligature is presumed; the healing is achieved *per primam*, so that the animals could leave the clinic at the end of the week after the removal of the sutures, and could be left to further domestic treatment. It naturally occurred that a suture would burst, or that occasionally even all the sutures loosened. The rending of the sutures was favoured by the circumstance that the tissue of granulation and the tissue of the exuberances is very spongy as a rule, so that needles must not be inserted superficially. In any case, however, by joining the lips of the wounds the time of healing was considerably shortened in comparison with my first procedure of healing *per secundam*.

By the suture of the wound I think that I have perfected this method of operation to such an extent that I can recommend it to the practitioner after it has proved a successful application during nearly six years of experience.

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SURGICAL TREATMENT OF THE HYPERTROPHIED AND DILATED HEART.

By LAURENCE O'SHAUGHNESSY, F.R.C.S. Eng.
Thoracic Surgeon to the London County Council, etc.
AND
JAMES McCUNN, M.R.C.V.S., M.R.C.S., L.R.C.P.
Royal Veterinary College.

A Preliminary Note.

CARDIAC hypertrophy is a natural response to various types of cardiovascular disease in man, forming part of a compensatory mechanism which enables life to be prolonged despite gross pathological changes in the vessels or in the heart itself. Almost thirty years ago Morison, of Edinburgh, suggested that the value of cardiac hypertrophy was often vitiated by the fact that the heart was enclosed in the rigid cage of the bony thorax, and he proposed to excise the ribs in the præcordial area to give the hypertrophied organ better working conditions. A similar operation had been proposed and carried out by Brauer some years earlier for the relief of quite a different condition—adhesive mediastinopericarditis.

A few operations of the Morison type were carried out, but interest in the problem subsided until it was revived by the recent experimental work of Felix. Felix attacked the problem in rather a different way, by focussing his attention not on the bony chest-wall, but on the fibrous pericardium. He observed that when there was marked cardiac hypertrophy the pericardium often failed to compensate and became tightly stretched over the enlarged heart. There ensued a struggle for accommodation between the left and the right heart, in which the thick-walled left ventricle had an unfair advantage. Under these conditions there appeared evidence of embarrassment of the right heart—a high venous pressure together with dyspnœa and cyanosis on attempted exertion. Felix showed that a long incision into the pericardial sac (spaltung) permitted the left heart to bulge out into the left pleural sac and relieved the syndrome. The heart was approached through an intercostal incision and the ribs left intact. It is of passing interest to note that two operations of the Morison type were recently reported by Graham ; in one case some improvement was observed, and in this case the fibrous pericardium had been inadvertently opened.

In the racing greyhound the heart is subjected to great strain. The efficiency of this animal's heart is remarkable. In the majority of cases compensation is of such a high order that its efficiency remains unimpaired. We have, however, noticed a cardiac syndrome in the racing greyhound, at first characterised by cardiac hypertrophy, which in its turn may be followed by dilatation and accompanied by evidence of impairment of the function of the right heart. In a typical case the chain of symptoms is as follows :

A dog which has been able to cover, say, 525 yards in from 30–32 seconds is observed to fade at about 350–400 yards. From this point he gradually " tails " off, and he finishes at a " distance " behind his competitors. Towards the end of the race he is obviously distressed, and his time may be as bad as 35–37 seconds. In some cases the dog may not even finish.

On examination after a race there will be evidence of general distress, marked cyanosis of the tongue, dyspnœa, a heart which produces a marked thrill and an apex beat as far back as the eighth intercostal space. Auscultation reveals pronounced tachydardia and a loud systolic murmur obliterating the first sound.

A normal fit dog will settle down in twenty minutes after exertion, and it is a remarkable fact that if such a dog is then raced again he will do the course in better time then he attained in his first effort. A dog the subject of the cardiac syndrome previously mentioned may take 40–60 minutes to settle down. If raced again, his performance would be deplorable. A proportion of such cases will improve under medicinal measures. Many dogs, however, do not respond to such treatment, and it was therefore decided to attempt operative treatment along the following lines :

Under general narcosis the left chest was entered in the sixth intercostal space, and suitable retraction gave an excellent exposure of the heart and peri-

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cardium. On opening the chest, the pneumothorax factor was controlled by means of the Tiegel-Henle Positive Pressure apparatus. In all cases it was noticed that the heart was greatly enlarged and the pericardium was tightly stretched over it. It was difficult to seize and pick up the pericardium. In the normal dog this manœuvre can be carried out with the greatest ease. The pericardium was picked up ventral to the phrenic nerve and widely incised over the left ventricle. The left ventricle was seen to bulge into the left pleural space. The pericardial incision was left open. The incision in the chest wall was closed in layers over a fully inflated lung. Three animals have been operated upon. The first and third made rapid and uneventful recoveries, and the subsequent progress is appended.

The second animal died shortly after operation, and at autopsy there appeared to be evidence of acute congestive heart failure. The issue in this case was, however, confused by the fact that nembutal was the anæsthetic used.

Our observations were checked by radiological examinations before and after operation. Alterations in the contour of the heart were noted, particularly the fact that after operation the heart became much more conical.

Progress Reports.

No. 1.—*Brindle Dog*, aged two and a-half years. Clinical and radiological evidence of cardiac dilatation and right-side failure. Distress, dyspnœa, cyanosis and staggering gait after racing. Dog unfit for racing. 15.8.34, operation at Royal Veterinary College; 16.1.35, trial over 525 yards with three other dogs. Heavy going. The dog was untrained, but managed to complete the course with less distress than previously to operation. This dog was "unraceable" before operation. In this trial he was handicapped by a recent stitch abscess, and his time was thirty-six seconds.

In June, 1935, an opportunity arose to put both dogs under training conditions. 25.9.35, trial 525 yards, time 35.68 seconds. He ran with No. 3 dog. He slowed a little in the last 40–50 yards, but finished without distress and with a pink tongue. 2.10.35, trial 525 yards, time 34.86 seconds, with No. 3 dog. Finished exceptionally well.

No. 3.—*Fawn Dog*, aged four and a-half years. It was possible to give this dog a trial previous to operation. Distance 525 yards. There was marked distress, dyspnœa and cyanosis. Time 35.8 seconds. Clinical and radiological evidence of dilatation.

January 24th, 1935.—Operation at Royal Veterinary College. Good recovery. This dog put on a lot of fat during convalescence. 15.9.35, trial 525 yards, time 35.53 seconds; 25.9.35, trial 525 yards, time 34,60 seconds; 2.10.35, trial 525 yards, time 34.87 seconds. This dog finished very strong in these trials. The third trial was run in heavy going, and this accounts for the slight increase in time.

The trainer under whose care they are, reports: "No. 3 dog is the stronger

finisher, although they both finish exceptionally well. They both finish strong and firm on their legs, and keen to go on again. Neither are any more distressed than are normal dogs."

Conclusions.

The operative material has been too small to allow of a definite clinical judgment as to the value of the operation described, but we would emphasise two points :

In the first place it is a fact that the fibrous pericardium is tightly stretched over the hypertrophied heart, just as the dura mater is stretched over an œdematous brain, and this is a fact which can only be appreciated by viewing the large heart under normal and pathological conditions ; its significance cannot be appreciated at post-mortem. In the second place the fact that two animals not merely recovered from a major intervention in the chest, but were capable of the most severe physical exertion, is in itself significant.

We desire to express our thanks to Mr. J. L. Hattrick for the loan of the Tiegel-Henle Positive Pressure Apparatus ; to Messrs. Smith and Watson, of the Buxton Browne Farm, for valuable technical assistance ; to Mrs. Bell, and Messrs. Smith and Southeran of the Royal Veterinary College, for their devoted hospital care ; and to Capt Neilson and Mr. F. Reed for their collaboration in the subsequent training and trial period.

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PROLAPSE OF THE RECTUM IN THE DOG AND CAT : OPERATION OF FLANK COLOPEXY.

By J. G. WRIGHT, F.R.C.V.S.

Department of Surgery, Royal Veterinary College, London.

THE incidence of prolapse of the rectum in the dog and cat is not high, although it is a condition with which every practitioner engaged in small animal work is familiar. It is much more frequently met in the immature than the mature animal. Breed and sex do not appear to play any predisposing part.

It is generally accepted that straining, together with an atonic condition of the anal sphincter, is the cause. It generally accompanies severe diarrhœa, and may be a complication of canine distemper. It is very exceptional for the condition to be associated with rectal impaction. It is admitted that a temporary eversion of the rectal mucosa may accompany the frequent straining associated with this condition, but it is probable that the typical rectal prolapse is caused by irregular peristaltic action in the colon and rectum, and that invagination is the primary state.

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The condition is generally complete, comprising all coats ; from two to four inches or even more of the terminal part of the bowel having passed through the anus. Diagnosis seldom presents difficulties. An intussusception of the ileum through the ileo-colic valve which protrudes from the anus is the condition with which it is most likely to be confused, although the presence of rectal polypi which become exposed due to straining should be mentioned. The appearance of a prolapse is characteristic. The mucosa, particularly near its junction with the anus tends to be thrown into encircling rugie. It is generally bright-red in colour from active congestion. The extra-anal portion of an intussusception is much more turgid and tube-like. Its colour is much darker. Diagnosis is easily confirmed by examination. In the case of the prolapse the mucosa joins up

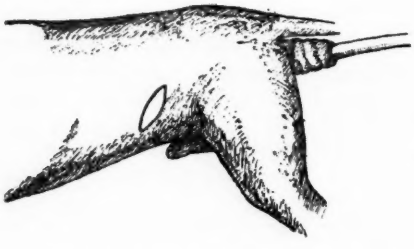

FIG. 1.—The site of incision. A gum-elastic sound is introduced into the colon.

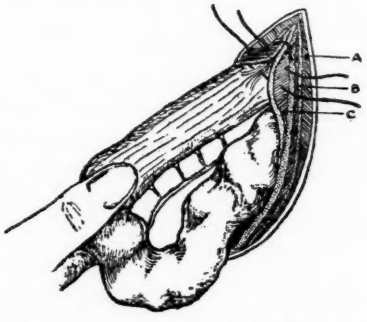

FIG. 2.—Suturing colon to abdominal wall.
A—M. obliq. abdom. ext.
B—M. obliq. abdom int.
C—M. transversus abdom.

with the integument at the anus, whereas with the intussusception the structure occupies the rectum and a probe can be inserted between it and the rectal mucosa.

Advice is generally sought early. As a rule the condition has not been present more than twenty-four hours, although occasionally a case will be met the duration of which is a week or more. In these there may be considerable superficial necrosis of the mucosa. This, however, can quickly regenerate, provided it is not grossly wounded.

What are the orthodox lines of treatment ? Simple replacement is futile, as the condition invariably recurs. It has been suggested that Gersuny's operation, comprising the injection of molten paraffin wax into the perirectal tissue might be applied to animals. It is improbable that this operation will be successful in cases in which the prolapse is so extensive as it is in the dog and cat. Amputation is the operation most frequently recommended and performed. Various methods of ligation prior to section have been employed. In the writer's hands results have not been good, recovery being the exception rather than the rule. Death has generally occurred from peritonitis, although an additional danger

is that necrosis of the tissue enclosed in the ligatures may lead to protrusion of the small intestine.

Sir Frederick Hobday, in his work " Surgical Diseases of the Dog and Cat," describes a successful case in which he performed proctopexia. The operation comprised suture of the mesentery to the abdominal wall, using a ventral, mid-line incision.

The writer has adopted a method of fixation of the colon itself to the left flank in nine cases in the dog and cat. The animals comprised: Five puppies between the ages of three and four months; two puppies between the ages of six and eight months; one adult dog—a four-year-old Peke male; one adult cat—a three-year-old castrated male.

Operation.—General anæsthesia is induced: in the dog by the slow intravenous injection of nembutal, and the cat ether-oxygen by inhalation; and the site prepared. A gum-elastic sound, 0.7 to 1 cm. ($\frac{3}{8}$ inch) diameter, is lubricated and introduced into the colon to facilitate quick recognition of this structure during operation. An incision, 3 to 3.5 cm. ($1\frac{1}{4}$ to $1\frac{1}{2}$ inches) long, is made in the resilient part of the flank, diagonally downwards and forwards, its supero-posterior commissure lying under the anterior border of the ilium (Fig. 1). All bleeding points should be arrested either by forcipressure or ligature as operation proceeds. Having incised the skin and subcutaneous fat the external oblique abdominal muscle is exposed, the direction of its fibres being at right angles to that of the incision, *i.e.*, downwards and backwards. The muscle is picked up with forceps and incised in the same direction as the skin wound, taking care not to " undercut " the skin incision. The internal oblique muscle is now exposed. This is considerably thicker than the preceding muscle, and its fibres run parallel with the incision. This is incised in the same way. The transversus muscle is now exposed. It is thinner than the preceding two, and its deep surface is lined by the parietal peritoneum. It is fixed with forceps and drawn well out of the wound, tent fashion, to avoid injury to the underlying structures when incising it. Having opened the abdominal cavity the greater omentum will be seen beneath the wound. It is pushed forwards. The index-finger is inserted into the wound and the colon recognised by the sound in its lumen. By hooking the finger around it, it is drawn out of the wound. An assistant is instructed to slowly withdraw the sound from the rectum as the colon is pulled out of the wound. By traction on the distal portion of the colon the prolapse is easily reduced. Fixation is effected by suturing the colon to the peritoneum and transversus muscle. Whilst an assistant exerts traction on the distal part of the exposed colon, three No. 0 catgut interrupted sutures are inserted 0.5 cm. ($\frac{1}{4}$ inch) apart, using a 4 cm. ($1\frac{1}{2}$ inch) straight needle. The uppermost is immediately beneath the upper commissure of the wound. From behind forwards these ligatures will include about 0.3 cm. ($\frac{1}{8}$ inch) of the transversus with the underlying peritoneum; underrun the serous coat of the colon for a similar distance, and then take up the peritoneum and transversus on the far side of the wound (Fig. 2).

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Care should have been taken to have only a minimum amount of colon exposed, otherwise difficulty may be experienced in returning the remainder into the abdomen. The loop of colon still exposed is carefully returned.

The wound is closed by three layers of gut sutures. The deepest includes the remainder of the transversus muscle and peritoneum, and care should be taken that the lower commissure is effectively closed, or an omental hernia may occur. The second includes the internal and external oblique muscles, and the superficial one the subcutaneous fat and skin.

The wound is covered by a gauze pad, and a bandage applied. There is no after-treatment as far as the wound is concerned ; the skin sutures being removed on the sixth day. The animal should be kept on a light, easily-digested diet, and the alimentary canal treated by the administration of protectives such as kaolin, bismuth carbonate ; alkalis and hyoscyamus preparations to check excessive peristalsis. Prognosis is good. In this series of nine cases, six have made uneventful recoveries. In one only has the anchor torn away and the prolapse recurred. Details of this case are as follows :

Subject, a seven months' bull-terrier female. Rectal prolapse of five days' duration. Some superficial necrosis and hæmorrhage. Flank colopexy performed. The wound healed by first intention and a radiograph showed the anchor to be holding on the sixth day. Diarrhœa, however, persisted, with marked straining. On the eighth day prolapse recurred. Laparotomy was again performed, a mid-line incision being adopted. The anchor has broken down, and so a second one was made, this time to the rectus abdominis muscle. From this point recovery occurred.

In the second case, a three months' puppy, an omental hernia occurred in the lower commissure of the wound at the forty-eighth hour, due to interference by the patient. This necessitated re-suturing. There was no breakdown of the anchor and the animal made a rapid recovery. In the third case the animal died fourteen days after operation from canine distemper. Post-mortem examination revealed firm adhesions of the colon to the abdominal wall.

I wish to acknowledge the help of my colleague, Miss M. Oyler, M.R.C.V.S., who has worked with me.

THE VALUE OF INDUSTRIAL SPIRIT IN THE TREATMENT OF WAX IRRITATION OF THE WALL OF THE CAVITY OF THE EAR IN THE DOG.

By HENRY GRAY, M.R.C.V.S.

Kensington.

MANY smooth-coated dogs with no hair inside the lining membrane of the cavity of the ear often flap their ears repeatedly, which not rarely produces ulceration inside the tip, which sometimes brings about slitting of it when there

Examples of DIAGNOSIS BY RADIOGRAPHY

by Major HAMILTON KIRK, M.R.C.V.S., Golders Green, N.W.

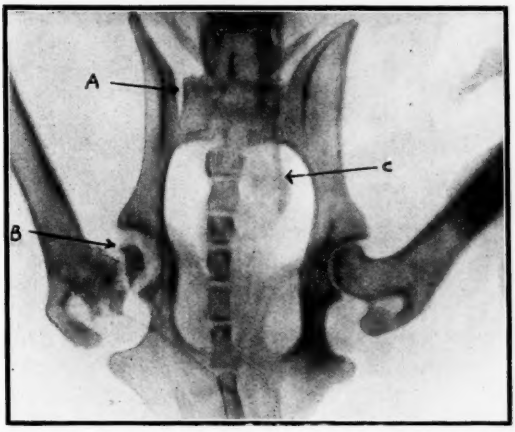

FIG. 1.—Skiagraph of the pelvis of a Fox Terrier, showing at A a partial disunion of the sacro-iliac joint; and at B a bad fracture of the head of the femur. Part of the articular head is seen, detached, in the acetabulum. This type of injury is apt to mislead the clinician into believing that he is dealing with a dislocated hip, and in that belief he may attempt reduction, to the severe detriment of the animal. It is seldom indeed that a true diagnosis can be arrived at in these cases without the aid of a radiograph. For this reason all dislocated hips, and those suspected of dislocation, should be X-rayed before severe manipulative treatment is attempted. At C will be noticed a narrow longitudinal shadow extending for two inches in a forward direction. This is caused by the os penis. *(X-Ray photo by H. Kirk.)*

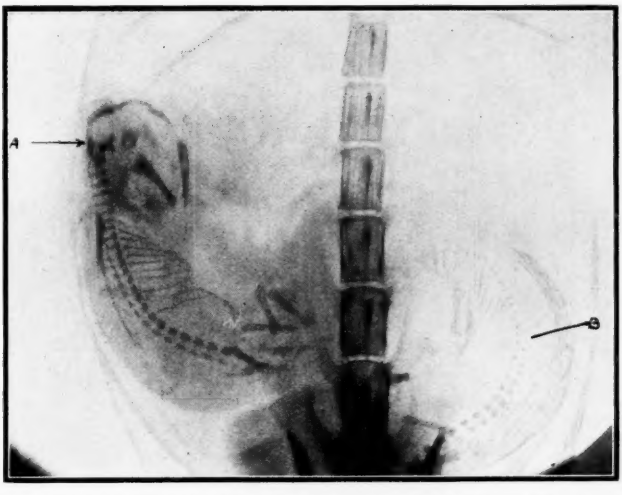

FIG. 2.—This depicts the abdominal cavity of a cat in which is clearly shown the outline of two fœtuses, both malpresented. The cat was within about six days of term, and it was unsuspected by the owner that she was in kitten. It has been said by some veterinary surgeons that X-rays would be useless for the detection of pregnancy, but such an assertion has been abundantly disproved on many occasions. Little may be seen, however, until some fœtal bone formation has taken place, and that has been estimated by Wright to be somewhere about the fifty-eighth day of pregnancy. In the cat under discussion nobody knew the date of service, but parturition did not occur until six days after it was radiographed, when it happened normally. This would seem to show that fœtal bone formation can be clearly demonstrable (at least in some cases) at or before the fifty-seventh day. At A is seen a fœtal head: and at B the spinal column of a second fœtus. For the radiographic detection of fœtuses more of the soft rays should be employed, as greater detail of soft tissues is thereby obtained. *(X-Ray photo by H. Kirk.)*

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Example of DIAGNOSIS BY RADIOGRAPHY

by Major HAMILTON KIRK, M.R.C.V.S., Golders Green, N.W.

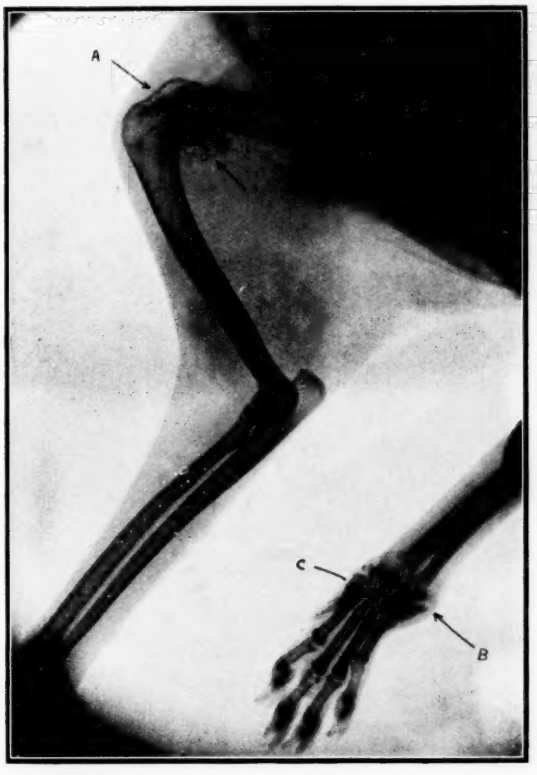

FIG. 3.—A unique case of rheumatoid arthritis in a nine-year-old cat. The forelegs were permanently flexed and useless, as are the limbs of human beings suffering from arthritis deformans. The shoulder-joint in the radiograph shows a dark area (at A) surrounding it, and proved on post-mortem to be complete anchylosis. In view of the great mobility of the normal shoulder-joint, it is all the more remarkable that anchylosis should have occurred in such a position. At B and C will be observed considerable exostosis about the carpal joint of the opposite leg, and there were similar osseous outgrowths about the elbow. No glandular lesions were discovered, nor was there any abnormality of the heart. I have never before, nor since, encountered articular rheumatism in the domestic cat, but regarded this animal as immune against rheumatism. *(X-Ray photo by H. Kirk.)*

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Example of DIAGNOSIS BY RADIOGRAPHY

by Major HAMILTON KIRK, M.R.C.V.S., Golders Green, N.W.

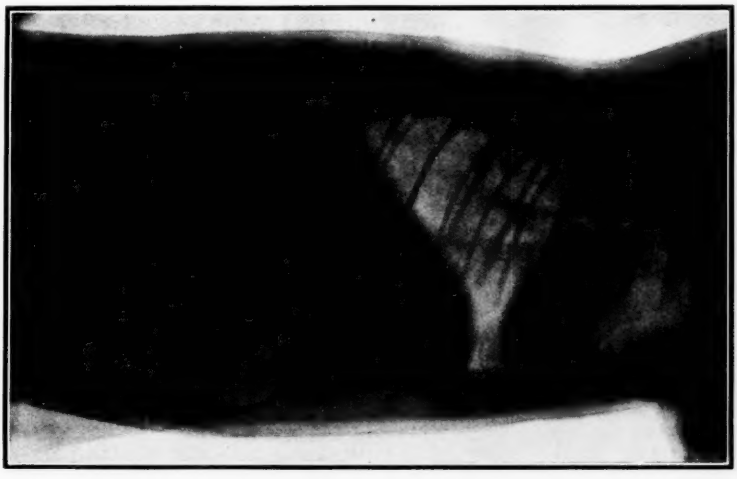

FIG 4.—This illustration depicts the thoracic and abdominal cavities of a cat which was brought to be X-rayed because it was suspected that a foreign body had been swallowed. The chief symptoms were marked depression and continuous vomition, symptoms which are constant in cases of feline enteritis. No foreign body is revealed, but the walls of the intestines are shown up with remarkably clarity. Such a result could not have been obtained had the bowel walls not been so thickened and dense. One does not make a practice of radiographing cats whose diseases have already been diagnosed as specific enteritis, but this skiagraph does rather point to the possibility of confirming such a diagnosis in this disease by means of X-rays. Not one in a hundred radiographs of cats' abdomens would reveal the coils of bowel so plainly unless, as I submit, these were structurally altered by pathological processes. Incidentally, the bifurcation of the trachea just over and behind the heart is well shown, as also is the heart shadow itself. In addition, the outlines of the liver and kidneys are very clear. The exposure in this case was three-quarters of a second at sixteen inches, with two screens. *(X-Ray photo by H. Kirk.)*

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is an accumulation of wax at the bottom of the cavity. It is useless to treat the effect unless the cause of the flapping is removed. When the cause is removed the effect ceases without any further treatment. In these cases there is no discharge, congestion or swelling. The various methods of treatment do not seem to give any permanent benefit. After long experience I have found that the daily instillation of industrial methylated spirit and external manipulation between thumb and forefinger of the root of the ear, while the tip is held with the left hand, loosens the wax, and if not removed mechanically with a scoop or the loop end of a hair-pin, the animal shakes it out by flapping the ears. After this treatment has been carried on for some time the flapping ceases, and should there be any ulceration of the tip this gradually disappears without any special treatment.

IS CAPPED ELBOW IN THE LARGE BREEDS OF YOUNG DOGS DUE TO TUBERCULOSIS ?

By HENRY GRAY, M.R.C.V.S.
Kensington.

I HAVE encountered many cases of capped elbow in young dogs of the larger breeds, and in some of them which have died soon after I have found mesenteric tuberculosis. I am sorry I did not anticipate the true nature of the cause and have the cystic contents of the capped elbow examined bacteriologically. The enlarged cystic knee of cattle is due to tuberculous infection. Tuberculosis of the larger breeds is much more frequent than it is in the small breeds. In some kennels it has occurred as an enzootic, due to the fact that the animals are fed on raw flesh, probably from tuberculous cattle discarded as unfit for human food, and also on raw milk from such animals.

DENTISTRY OF THE DOG.

By H. RAYNOR HEWETSON, M.R.C.V.S.
Southport.

So little is written and demonstrated of the oral troubles of the dog that a few notes on the methods and equipment I employ to deal with the everyday requirements in this field may be worth setting out.

Before proceeding to actual work in the mouth, a few observations on anæsthesia will not be out of place. All anæsthetic work pleases the client and helps to lift the veterinarian above the rut of quacks and dogmen.

Even for the extraction of loose temporary teeth, a topical anæsthetic will help to overcome the puppy's resistance and lessen its shock and pain, so that future visits to the " doctor " will not be so violently resented. There is nothing raises prestige higher than a puppy or dog who is pleased to come back, and unfortunately the converse holds also. Topocaine (Waite's) painted on the dried

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gum a few seconds before the forceps are applied will result in a surprising amount of mauling being tolerated. There is a slight objection to the tingling which the application causes, but this is not so serious as the objection taken to the prick of the needle. In cases were local anæsthetics are to be injected, the painting of the site of injection with this instead of iodine will render the introduction of the needle painless. For injection anæsthesia I prefer the nerve-blocking method which was well described by J. T. Edwards in the *Veterinary Record* (April 21st, 1932, p. 523). Where the patient is docile practically any tooth may be extracted without pain by this method, which is also simpler to perform than supra-periosteal infiltration.

Where really serious work is afoot, or where the patient is restless or ill-tempered, general anæsthesia is indicated. A patient completely relaxed is much simpler to deal with, and tends to much better work. In oral work the injection anæsthetics, *e.g.*, intravenous nembutal or evipan sodium, have obvious advantages over inhalation anæsthetics. When using inhalation methods, after deep anæsthesia has been induced, the easiest method to maintain it I have found is to block the nostrils, pull out the tongue, and hold a small chloroform-soaked swab on a sponge holder at the back of the mouth. Even in these circumstances there is a tendency for the patient to come out, and the operation has to be suspended while the ordinary mask is applied.

(1) *Extraction of Temporary Teeth.*—A topical anæsthetic is indicated and effective. Very little difficulty is encountered in making clean extractions here. In some cases the canines, and in a less degree the incisors, may remain late and not be much loosened by the eruption of the permanents. Many are satisfied if they are broken off below gum level, and it is true that teeth so broken do rapidly disintegrate and become absorbed. Nevertheless, it is better to extract them clean, and this is fairly easily and consistently done if they are extracted by twisting rather than by pulling or leverage. In respect of the canines the forceps should be pushed up between tooth and gum as far as possible, the tooth grasped firmly, and the twist—this is the important point—made forwards and inwards. Gray's pattern forceps are most suitable for these teeth.

(2) *Scaling and Dressing of Permanent Teeth.*—It is unfortunate that tooth cleaning has become so much practised at dog beauty shops, since what the client looks for is the white appearance of the crowns of the teeth which can easily be seen, and is apt to cavil at the extra expense of the time spent on parts which do not show, and it is precisely these parts, close to the gum on the inside as well as outside, and in the interdental spaces of the upper and lower teeth, where trouble starts.

A Mitchell's trimmer (Ash 4), perhaps also a fine scaling chisel, will do practically everything that is required, though some may like to supplement them with right- and left-hand scalers. The object of scaling should be to remove every particle of tartar inside, outside, or between the teeth, which comes in close apposition to the gum without injuring it. To leave any tartar close up is to

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leave pockets for the collection of food particles and organisms, and consequently pus ; to cut or damage the gum is to open the field for a septic gingivitis. Using the trimmer, the convex side of the spoon-shaped end gently pushes the gum away, and the sharp edge is then pressed on the tooth at the rim of tartar and, with firm pressure on the tooth, pulled towards the crown at right angles from the gum.

The triangular end or the small chisel will be useful for the interdental spaces, and here it may not always be possible to draw directly away from the gum, but at the worst the movement need only be oblique. Whatever the temptation the instrument should not be drawn parallel along the edge of the gum.

To scale the lingual surfaces or the labial surfaces of the lower molars a gag may be used, and will possibly be necessary. I do not know a gag which has not at least as many bad points as good, and the best of them is a matter of personal preference. In most cases though, a piece of bandage tied just behind the canines on the upper jaw, held by an assistant, a similar one on the lower jaw held by the operator, suffices with much less trouble than a gag. In many cases where the patient is brought with a heavy tartar, spongy gums and a number of loose teeth, I find the best plan is to scale off the worst of the tartar and extract the most obvious teeth needing it, and then leave it for a fortnight while the mouth clears up and fine work becomes possible. It is hopeless to attempt to make a good job of teeth over which blood is oozing all the time, and for this reason where scaling and extractions have to be done at the same visit, the extractions should be done last. In a healthy mouth for which the sole purpose of scaling is appearance, a fine polished finish can be given by a gentle brushing over with powdered cuttle bone. Where there is recession and the sensitive roots are being exposed, the dressing of the exposed root with silver nitrate will seal the fine openings of the cement and desensitise the surface. A single application will usually be sufficient for these purposes, and excessive application of silver nitrate will damage the gum and cause further recession. In mild gingivitis or pyorrhœa any of the usual antiseptic and astringent washes or lotions may be found useful. In severer cases a good one which the owner can use daily is Eubrol (P. D. & Co.). A saturated solution of copper sulphate is excellent in soft bleeding and badly-infected gums, but is only really safe and effective in professional hands.

(3) *Extraction of Permanent Teeth.*—Apart from the extractions rendered necessary by alveolar pyorrhœa and alveolitis, which are relatively simple owing to the looseness of the teeth in the absorbing alveolus, extractions of teeth which have undergone no loosening changes are frequently necessary, and it is these which present our greatest difficulty. We all know the foul-smelling mouth with receded and spongy gums, full of discharging pus pockets and the teeth coated with a slimy tartar, but of which the roots are not affected. We are only wasting our time by scaling, cleaning and dressing many of these, and we frequently know it, since a couple of weeks sees them just as bad as ever again, but hesitate

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to take the bold but only course of total removal. Again, teeth may be damaged about the crowns, or split, or the presence of pus in the antrum may mean that removal is a necessity, and we must be prepared to take out any tooth in the head under any circumstances. The customary advice of our text-books, to grasp the tooth firmly above the crown with the forceps, rock it from side to side, and then remove by a strong pull parallel to the long axis, would be merely comic in its futility were it not for the tragedy of pain and suffering which many dogs must endure from the fractured stumps and pieces which they carry around from many well-meant attempts to carry out this advice. I will not say that firm teeth cannot be cleanly extracted with forceps only, but I do venture to opine that in the case of a firm canine or carnassial the operator must have the patience of Job and the wrists of Hercules if he relies on forceps alone. The difficulties arise largely from the large proportion of embedded root to exposed crown, the brittleness and liability to fracture of the teeth themselves, and the difficulties of steadying the jaw while the movements are being made.

In the lower jaw care has to be exercised, particularly with the canines, against the risk of fracturing the jaw, especially at the symphysis.

The most necessary accessory is a treadle dental engine. Cutting burrs may be used for drilling away the bone of the outer alveolus, and also for dividing the crowns. By these means any tooth may be removed cleanly and with fair expedition; but an added luxury for those who do not mind expense (£9 9s.) is an impactor. This is a small automatic chisel which is attached to the engine just as an ordinary drill-head, with which various shaped and sized chisel-heads may be used. The mechanism is such that when applied with pressure to a solid substance such as bone, the chisel-head gives regular, short, sharp kicks in a similar way to the pneumatic drill used for breaking up roads and concrete. Its appetite for devouring bone is a delight. Much slower but much cheaper are a number of small cold steel chisels, tapped with a small hammer. Typical methods of using these aids are best described as separate operations on the different teeth.

Incisors.—For ordinary extractions a stump forceps such as Ash No. 76 or Ash No. 1 for the upper jaw, and the right-angle stump type, Ash No. 74, for the lower jaw, should be applied about one-eighth to a quarter inch beyond the gum level and sufficient squeezing pressure applied to break through the bone onto the tooth. Gentle, firm, gradually increasing backwards-and-forwards twisting movement should loosen the tooth so that it may be drawn out.

Difficulty is seldom experienced with incisors, but where they give trouble or appear very firm, a modification of the methods described for the canines will apply. In the case of a broken root, where the tooth on one side of it is out cleanly, the stump may be forced out with an elevator inserted under the root from the adjacent empty socket.

Canines.—These are the *pièces de resistance.* My method is to map out the estimated position and extent of the root. Next, with a sharp knife incise the gum along the whole length of this area, in the case of the uppers, medially

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along the flat side, in the lowers in the postero-lateral aspect down to the mental foramen, and reflect back the gum to expose the bone over the whole of the root. This reflected gum may be either now cut away or, alternatively, the two flaps may be sutured back in apposition after the tooth has been removed. The chief thing for decent healing is that spare pieces of tissue should not be left.

If drills are to be used, the next stage is to drill right through the bone onto the tooth, along the estimated front and back edges of the root, converging on the apex and using a fine, long, cutting burr. If the estimation has been accurate and the drilling precise (a few spare skulls of different sizes at hand for comparison help for this) it will now be possible to loosen and remove the tooth with the fingers, but in the much more likely event of the amount of drilling being underestimated, some further drilling or backwards-and-forwards twisting of the tooth with forceps will be necessary. The small chisels and hammer are very useful at this stage to lift off the separated bone, and so show what of the root is released. When sufficient bone has been removed the forceps should be applied as high as possible, long wide beaks being very desirable, so that the grip on the tooth is not confined to one spot. Narrow beaks tend to cut into the flat surface of these teeth, increasing the difficulties greatly. If the impactor is available the gum is similarly reflected, and the chisel applied at the junction of the bone and tooth, and directed towards the apex. This completely removes the bone as it goes forward, and in a very short time the tooth may be practically lifted out of its socket. Much pressure should never be applied with forceps on the lower canines, which very easily split along the long axis of the crown. If extra aids such as drills or impactor are not used for canine teeth, half-an-hour's gentle rocking backwards and forwards per tooth is not too little to have to spend to loosen it sufficiently for extraction.

Upper Premolars.—This first three may always be removed with forceps only; in the case of the second and third, if they are firm it is sometimes (in large dogs) preferable either to drill or split the crown between the two roots so that each root may be extracted separately. In all teeth it is the outer wall of the alveolus which must be broken down before the tooth can come out, and forceps should be applied with this in mind. In these cases the pressure of the forceps applied high enough on the outside will crack the wall, after which leverage outwards results in a clean removal. Broken bone of the wall should never be left in and may be cut or dissected out if it does not come to the forceps. If left, healing will be greatly retarded.

The Upper Carnassial.—The problem of this tooth is the clean removal of the antero-internal root, usually chiefly desired. In cases of pus in the antrum, however, this usually solves itself, since the infection at its base is sufficient to loosen it all down the socket. Breaking down the outer wall of bone as described for the canines is helpful, and where all roots appear firm it is again desirable to divide the crown between the two lobes to make two extractions. Using Ash forceps 76H, just above gum level on the lingual aspect of the antero-internal root, the outer root will be broken on to about its middle, and leverage outwards

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will break down the outer wall and drag out the inner root on a direct line of its axis. The single posterior root will now present no trouble if dealt with in exactly similar manner.

The Upper Molars.—The inside root of the first of these is the largest, but its shape is such that it cannot resist dragging pressure, and the smaller outer roots are the more likely to be broken. Again using 76H forceps, grip the anterior and medial roots above gum level and squeeze until there is a crack, repeat on the posterior and medial roots. Now gently lever outwards on each in turn until it is so loose on both that outward leverage brings it all away. The last upper molar has very little root and never presents any difficulty if well grasped and levered outwards.

The Lower Premolars.—Using Ash forceps No. 74, or Gray No. 13, grasp the jaw-bone one-eighth to one-quarter inch below gum level and squeeze tightly, at the same time levering outwards. Repeat this on a line with each root, and gradually increasing pressure will result in the breaking-down of the outer wall and the sufficient loosening of the whole tooth.

The First Lower Molar.—For the perfect removal of this tooth, I believe the primary division of the crown between the two roots to be essential. This is done by drilling obliquely forward at an angle of 45 degrees from the trough immediately behind the highest point of the crown. In most cases after this has been done each root may be removed in the way suggested for the premolars. If great difficulty is found in loosening it then the drills, chisels or impactor may be used on the outer wall as described, but care is needed in using these on the bottom jaw.

The remarks on the last upper molar apply also to the second and third lower molars.

It is worth noting that whenever a tooth is seriously damaged, such as crown broken off or roots split, the resulting alveolitis will loosen the retained stump or stumps, and enable them to be fairly easily removed after three or four weeks. This process, though not very pleasant for the dog, is certainly preferable to the aching roots being left in indefinitely.

This is all the dentistry a veterinary surgeon may be expected to do as an everyday matter, but there are other items required occasionally for which the assistance of a dental surgeon will be desirable if not essential. Mention may well be made of the following :

(4) *Fillings.*—These are seldom required in our patients. The filling of erosion cavities, chiefly for the sake of appearance was described by Aronson and Lester on pages 311–312 of Vol. 91 of this Journal. Caries is extremely rare. I have noted it occasionally, chiefly in the lower carnassial, and when seen correct filling is very desirable as an alternative to extraction. Copper amalgam is the filling usually employed, as it not only sets well under adverse conditions, but is also sedative to a sensitive tooth. The most frequent cause of the need of fillings I have found have been broken canine crowns in which the break exposes

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the pulp cavity. Removal of a canine tooth more than any other alters the expression and appearance of the animal, and on this account they should be preserved wherever possible.

(5) *Wiring.*—This is a fairly simple operation for aiding the setting of fractures and may also be used for regulation of teeth. The most common application is for fractures of the lower symphysis. Silver wire of suitable gauge for the size of the dog is wound two or three times round the incisor teeth from corner to corner, and tightened up by twisting together in the front. Some may prefer to wind it round the canines, but unless the wire is cemented on or the tooth capped there is a tendency for the wire to slip up and off the sloping sides of these teeth. Wire wrapped round the canines and pulled tightly along the front only of the incisors is a common method of attempting regulation of protruding teeth or undershot jaw, but it is doubtful whether it is of much benefit in the dog. Similarly, wire may be tried across a couple of molars on each side of a fracture of the lower mandible, but a gold bridge is much more effective for this.

(6) *Crowning.*—Crowns may occasionally be useful for gagging the bite, that is for preventing certain teeth or parts of the jaw from approximating. In the case of a fractured mandible of one side the crowning of the lower carnassial of the other will prevent the top and bottom jaws from meeting on the damaged side, and so save the jars which would arise when taking nourishment. In one case, where an injury right through the lip tended to become permanent owing to the canine tooth continually catching and passing through it, I had rapid healing after affixing a temporary crown which elongated the tooth beyond where it could catch.

(7) *Bridge Work.*—Bridges are very useful in fractures of the lower jaw, and for this purpose really represent a series of crowns made in one piece. The expense of gold is not really a serious consideration, because it is all recovered on the completion of its task. The impressions are taken on a composition which when soaked in hot water is soft and moulds itself to the shape of the mouth and teeth and which subsequently cools hard. It is taken into the mouth on specially made aluminium trays made to the approximate size of the mouth, and the only difficulty lies in the fact that it is usually necessary to give a general anæsthetic for both the taking of the impression and the subsequent fixing, which is done with cement on to each tooth.

On one occasion my dental colleague made and fitted for me a bridge along all the temporary premolars of a nine weeks old Borzoi which had been worried by an adult dog and had both lower mandibles smashed and crushed. The impression of the puppy's mouth and teeth was compared with that of a similar puppy with a sound mouth, and the bridge made to fit the teeth of the injured puppy in the position of those of the sound one. Despite the age and the severity of the injuries, when the puppy grew up it went in the show ring without any defect being noticeable.

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Bridge work for false teeth, as also false teeth on plates, are only matters of interest and are not of any real help to the dog.

(8) *Orthodontics.*—Considering what a great demand there is for perfecting the mouths of show animals which are not naturally right, it is surprising that so little is done on this subject. One hears of dogmen who can straighten teeth and push back undershot jaws, but one sees really very little of their work. My own attempts have been very disappointing ; even where a dog has satisfactorily worn a wire, crown, wedge, or other device, and something like the desired result has been achieved, the teeth have subsequently reverted to their malposition.

SERUM THERAPY AND SECONDARY INFECTIONS IN DISTEMPER.

By W. R. McKINNA, M.R.C.V.S., D.V.S.M.
Huddersfield.

SINCE the researches of Laidlaw and Dunkin and the continuance of their work by Dalling have put into our hands the powerful weapon of hyperimmune serum in the prophylaxis and treatment of distemper in the dog, great assistance is given in the subduing of cases diagnosed in the early stages. The careful and observant owner will seek expert advice as soon as the young dog is ill, and the use of serum at this stage will almost certainly abort an attack. The ailing patient, subdued and quiet with the infection and exhibiting a temperature ranging between 103.4° and 105° F., shows a remarkable improvement in its general condition within twenty-four to forty-eight hours. After that, in the case of the household dog, care in diet and a restful period of about ten to fourteen days will see the end of infection and a return to normal health in most cases.

When treating an outbreak in a kennel of dogs, however, the results are not so good. This has been borne out in the writer's experience during the past eighteen months. Distemper has been suspected by observant owners and assistance sought in the early stages. The injections of serum in infected and in-contact susceptible puppies at first appears to have acted quite specifically, and all goes well for about ten days or so. Then one or two and, finally, most of the patients develop the various secondary complications we find with the disease. Additional doses of serum at this stage do not appear to influence the course of these sequelæ, which may not clear up for another three or four weeks. Treatment in these stages is of necessity symptomatic, and unfortunately we have no specific serum or vaccine to help us. Undoubtedly, anti-sera against *B. bronchisepticus*, the various preparations of antigens of organisms associated with distemper, are of use, but none has the value of the true anti-distemper serum used in the early stages of the disease.

The writer is indebted to Major Dalling for the suggestion that outbreaks treated with serum in their early stages should receive a second dose within

about a week in order to neutralise any free virus that may still be existent. This procedure has been recently followed, and with gratifying results. The cost of serum and the apparent excellent progress after the first injection had previously made one hesitate in incurring the owner in additional expense. It is worth while, however, and saves so much additional labour in nursing and other costs when dealing with a number of dogs under one roof.

Of the type of case presented for treatment so often after the dog has been ill for ten to fourteen days there is little to be said. There appears to be but slight justification for the use of anti-sera, always expensive in themselves and too expensive to use in the quantities which one would need to give to prove of any benefit. In some cases antigens prepared from the secondary organisms associated with the disease provoke a satisfactory response and shorten the period of illness. All too frequently a fatal sequel is to be looked for, or the onset of nervous symptoms necessitating the animal's destruction.

We have a weapon of inestimable value in anti-distemper serum, and with it one can almost certainly control distemper infection when the case is seen in its initial stages. A further inoculation within a period of a few days appears to abort other sequelæ.

Is it within the range of possibilities that we may have in the not too-distant future an effective polyvalent serum that will neutralise the effects of the secondary microbial invaders which produce so much harm to the patient and so frequently render one's assistance of no avail ?

MUSCULAR RHEUMATISM IN DOGS.

By H. C. SWANN, M.R.C.V.S.
King's Lynn.

A VERY limited review of modern literature shows that the causes of muscular rheumatism in dogs are grouped under at least three main headings : Dietetic, toxic, chill.

Dietetic causes include foods which cause indigestion, fermentation, or constipation, and rations which are also too highly nitrogenous. Toxic causes include toxins derived from external or internal parasites, especially when the latter are present in large numbers, and also bacterial toxins. The latter may be derived from any seat of bacterial activity, including the mouth, stomach, bowel, anal glands, bladder, uterus, etc. I have given a fuller description of these causes under " Treatment," but in my experience the constant factor in the cause of muscular rheumatism in dogs, whether working primarily or secondarily to the toxic or dietetic causes, is that indescribable factor—chill. Chill may result from the conditions under which a dog is kept, such as dark, sunless, cold, damp or draughty kennels, and also from exposure to cold and wet conditions in the field. Another factor often associated with chill is fatigue. Thus, one would especially expect to find rheumatism in foxhounds, greyhounds, gun dogs, etc.,

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after a hard day's work in wet weather when they come home tired and are improperly dried. In my experience the toxic and dietetic causes of rheumatism have been the least important, and when present their susceptibility to rheumatism has been usually aggravated by " chill." Mention may also be made of rheumatic diathesis, that peculiar susceptibility which some dogs show, developing rheumatism without the least provocation, whereas other dogs kept under the same conditions remain free.

Symptoms.—Muscular rheumatism in dogs may be either acute or chronic. Acute rheumatism is characterised by repeated attacks of acute muscular pain which may last from a few minutes to several hours. During attacks the muscles are hard, tense and tender to the touch. Manipulation or voluntary movement may be accompanied by screaming of the patient in pain. In very nervous subjects the slightest noise may cause the patient to shriek from the pain accompanying sudden movement, or from the mere fear of being handled.

Muscles frequently affected include those of the neck, shoulders, back, abdomen, jaws, intercostal region, thigh, etc., and it is according to what group or groups of muscles are affected that symptoms depend. When the neck muscles are affected the patient has difficulty in moving his head in any direction, and walks with his head outstretched, sometimes taking short steps or dragging his fore-feet along the ground as if to avoid concussion. This dragging action of the fore-feet is especially noticeable when the shoulder muscles are affected, and at times the patient may be actually set fast and unable to move owing to the pain. When the loins are affected there is a general stiffness of the hind parts of the body. The patient may walk stiffly with an arched back and a dragging gait. The interference with locomotion in this type of rheumatism may cause any degree of partial paralysis. The pain accompanying it is aggravated by climbing slopes, and crying out when trying to climb stairs, etc., is often the first symptom the owner describes. When the abdominal muscles are affected the patient walks with fear and has a tucked-up appearance. The very slightest abdominal palpation causes him to draw up his muscles tightly and shriek with pain. I admit that on at least two occasions I have met these symptoms, and after an X-ray examination for a foreign body and delay in awaiting further symptoms I have reverted back to my original diagnosis of rheumatism. When the jaw muscles are affected voluntary or forced opening of the mouth often causes shrieks of pain.

When the intercostal muscles are affected there is the usual disinclination to move, acute pain on manipulation, and if one side of the chest only is affected attempts may be made to stand with a slight curvature of the full length of the body. Owing to the pain accompanying respirations these may become partly abdominal.

Owing to the crouching and straining accompanying defæcation and the consequent pain caused in groups of affected muscles, the act is often delayed, causing constipation. Likewise, constipation may be the effect of paralysis due to rheumatism of the back and loin. It is here convenient to refer to the

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condition known as chronic ossifying pachymeningitis, to which the attention of the profession was first directed in this country by Gray as early as 1904. (*Veterinary Record*, July 10th, 1904.) He gave a full description of the post-mortem appearances of the affection and the clinical phenomena based on the examination of a large number of cases. In this condition there is the formation of osseous plates of various sizes in the spinal canal which compress the roots of the spinal nerves and the cord itself, resulting in a painful neuralgic condition of the peripheral nerves and increased reflex action. After a series of attacks paraplegia may result. It has been suggested that this condition is caused by repeated attacks of rheumatism, some authorities going so far as to describe it as rheumatic inflammation of the meninges. During flare-ups of this condition, which are usually induced by exposure to chill, the symptoms resemble repeated attacks of acute rheumatism.

Treatment.

Stress has already been laid on the constipation which may be a cause or effect of rheumatism. I usually commence treatment with a purgative dose of castor oil, calomel, or saline, etc., and I find it often beneficial to allow repeated doses of a laxative such as liquid paraffin or a saline.

Salicylates.—The beneficial effect of salicylates in dogs is usually so marked that they may be regarded almost as a specific. They may be given as sodium salicylate, preferably in solution, or as aspirin in tablet or powder form. Failure to get a quick result is, in my opinion, often due to an insuffi cient dose. One must, however, bear in mind that they are toxic, the chief signs of poisoning being dyspnœa and convulsions due to heart failure, vomiting, irritation of the kidneys, with albuminuria, slight posterior paralysis, etc.

I prefer to commence salicylate treatment with two or three massive doses and continue with smaller doses at regular intervals. The combination of sodium bicarbonate with sodium salicylate is beneficial in that the former helps to reduce gastric hyperacidity and to prevent acidosis. Another salicylate sometimes used, but of which I have no experience, is methyl salicylate given in capsule. A prescription I have had good results with consists of a combination of sodium salicylate, potassium bicarbonate, magnesium sulphate and tinct. mucis vomica, repeated three times daily.

Colchicum has been recommended for chronic types of the disease and especially in combination with potassium iodide and mag. sulph. as a laxative. A proprietary preparation known as Colchi-sal contains colchicine salicylate and is said to be beneficial in some cases.

Local Treatment.—Internal treatment is by far the most important, but in lingering cases which have not shown a prompt response benefit may be derived by the local application of heat, or by counter-irritation. Heat is, in my opinion, best applied in a dry form in the cases of dogs, as any treatment making the coat wet renders the patient more liable to chill. I frequently use a radiant-heat lamp and give exposures of twenty minutes or so several times daily. I have had no

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experience of, but can see no marked benefit which is likely to be derived from, more costly lamps which are supposed to have some radio-active property, and which are at present on the market. Counter-irritation of affected muscles with ointments or liniments containing wintergreen, etc., is especially valuable in more chronic cases. Their chief drawback is their application to long-haired dogs, and especially the ladies' pet varieties.

Diet and Nursing.—The patient should be given a light diet, taking care to avoid excessive quantities of red meat, meat extracts, and soup. In cases which do not show a prompt response, alterations in the diet are often beneficial, there often being one particular item of the ration which seems to predispose the patient to flare-ups of the acute pain. In one instance I saw a Peke which, if the owner gave it eggs, would guarantee to show during the course of its illness an immediate response of acute pain.

The patient must be housed in a dry and warm house or kennel, and on no account be exposed to draughts or wet conditions. During and after convalescence it is very important to take a little more care with the conditions under which the dog is kept, and to explain to the owner the necessity for thoroughly drying him should be get wet, etc. Mention has been made of the existence of toxins which are likely to take part in the ætiology of rheumatism. Toxins may be derived from a gross infestation of external parasites such as fleas, ticks, etc., and similarly from gross infestation with internal parasites. In the case of the latter and when the cause of the disease is not obvious, suitable treatment for worm infestation could be combined with the initial dose of purgative.

Toxins may be derived from any seat of bacterial activity in the body, and during treatment it is advisable to subject the patient to a thorough routine examination, especial attention being paid to the teeth and anal glands, etc. In lingering cases this routine examination may be so thorough as to include a urine examination.

In conclusion, I would add that the majority of my cases have occurred in the country, and especially from October to May. Undoubtedly this is because of the extra care which townsfolk take with their pets, and the damp and wet conditions under which country dogs are liable to be worked, exercised and housed.

PRESCRIBE SMALLER DOSES OF DRUGS FOR DOGS.

By T. F. PRIME, M.R.C.V.S.
Upper Norwood.

For a long while now there has been a tendency to give much smaller doses of medicine than are given in text-books. This has been brought about, even in the larger dogs, partly by the owner of the animal and partly by the

practitioner finding that in so many cases he obtained better results from smaller doses than the large ones usually prescribed. Then, again, certain animals, like human beings, are unable to take some drugs, which, however useful and safe to the average animal, act as a poison to the dog and make it thoroughly ill. One has only to notice it in the case of Santonine and oil of male fern. Instead of the large ten-grain dog pills containing large doses of four or five active drugs, one finds that the little pill series, or even tablets, containing one or two special drugs are being used more and more, so as to obtain the special medicinal effect of the drug. With fluid medicines the same moderation in dosages is to be observed. Now, instead of large doses of cod-liver oil, which often with a dog recovering from a serious illness cause biliousness and loss of appetite, halibut oil capsules are used. The violent purgatives of older days are fast falling into disrepute, and croton oil and syrup of buckthorn are now rarely used, Epsom salts being given daily in milk or tea in very small doses instead of the comparatively large doses which we have been accustomed to give. When one considers that it has been usual to give a large terrier the same dose as a man, weighing as he does three or four times as much, one cannot but help thinking that the large doses act in many cases as a poison to the enfeebled system of the unfortunate animal. The present day well-bred dog cannot stand the heavy doses prescribed to the rough, hardy, coarse-bred animal. Alkaloids especially are given in too heavy doses, and the dosage of many should be halved.

One so often forgets, when continuing for a while, the cumulative effect of the drug, and one has only to take fairly heavy doses of quinine to soon become aware of it.

Many sedatives, when given in too large a dose, have quite a different effect on the animal than is expected. Since the War some of the older, well-tried, nearly-forgotten remedies have come back into use, such as salicin instead of quinine, kamala instead of areca nut, calumba instead of gentian. Many of the older practitioners seem to forget that so many breeds of dogs are now becoming miniatures to their former size and weight, and the dose for an Irish terrier to-day and the big dog of a few years ago is only half what it used to be. Many things have helped to bring this reaction about, such as the smaller doses taken by human beings, the non-usage of violent and nauseating drugs, also the increased number of toys. Then, again, their owners and kennelmaids have gradually given smaller and smaller doses with good results. How often, if one is not careful, the owner of the dog brings the medicine back and says it is too strong for the animal and makes it ill each time it is given ?

The town dog cannot and does not take the same dosage as a country dog. One of the most difficult problems to cope with is the great difference in body-weight and how to properly proportion the dose which is to be given to the animal. With the present carefully standardised animal and vegetable preparations, one need not give the large doses to produce the desired effect.

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HEATSTROKE AND SUNSTROKE.

By DAVID ERIC WILKINSON, M.R.C.V.S.
Chigwell.

DURING the tropical weather of the past three summers cases of heat- and sunstroke have been of very frequent occurrence in dogs. Most of the writer's cases were met with in breeding kennels of the most up-to-date design and construction, built with a south aspect and vita-glass windows with the laudable desire of catching as much sunshine as possible in this usually temperate climate.

Unfortunately, the owners of these kennels forgot to make allowance for the unexpected, and when tropical conditions arose disaster followed. In one such kennel six dogs were found dead early one morning and all the other inmates were depressed and ill.

On attending at the kennel in response to an urgent call, the writer had the greatest difficulty in persuading the owner that the losses were due to heatstroke and not to some form of poisoning or to some outbreak of illness of an unusually virulent type. Hanging a thermometer in the kennels and noting that the mercury rose in a few minutes to 84° F. went far to convince the owner the diagnosis of heatstroke was a correct one, whilst a fall in the temperature to 64° F. next day, after the kennel fronts and windows had been whitewashed and a general improvement in the condition of the survivors in spite of continued tropical sunlight, reassured her.

The reaction of the patient to sunstroke or heatstroke is essentially of nervous origin, and, as might be imagined, the symptoms exhibited vary greatly in accordance with the region affected. Cerebral congestion followed by effusion into the meninges, bulbar and spinal congestion, are amongst the most typical cases encountered, and vary in intensity and in their response to treatment according to the degrees of heat to which they have been subjected and to the frequency with which they have been exposed to these conditions. Death from deoxidation is frequently seen in dogs which have slept night after night in rooms, under glass verandahs, or in conservatories with a south aspect. In such cases the patients present a semi-comatose appearance with marked dyspnœa and cyanosis of the visible mucous membranes.

Two cases of the writer's had paralysis of the tongue and glottis, and were completely unable to swallow. One such dog, a Samoyede, which had been exposed to intense heat at two dog shows on successive days, followed by a long railway journey home, was unable to displace a piece of pudding placed on his tongue either by swallowing it or by ejecting it, the pudding being found in the same position an hour after it was laid on the tongue.

A similar case in an Irish red setter responded to bulbar and lumbar puncture, and is now, three years later, in perfect health. On bulbar puncture being performed a drachm of fluid escaped through the needle. Next day, as the hind limbs seemed out of control, lumbar puncture was performed. On this occasion

no fluid was evacuated from the canal, but the operation was followed by such marked improvement that it was repeated on five more occasions, seven times in all in three weeks.

The variety of symptoms exhibited gave rise to much confusion in the minds of dog owners. Such opposite conditions as obstinate constipation and chronic diarrhœa were remarked in the same kennels, whilst catarrhal symptoms following the primary illness frequently caused dog owners to suspect distemper. One owner is still convinced that the illness in her kennels last summer was distemper, in spite of the fact that a number of puppies belonging to three different litters which were in contact and constantly attended by the same kennel maids did not contract the disease. These puppies were in a more shady run than the other dogs and were not shut in at night. The attacks were always ushered in by severe rigors, and the loss of balance in circulation so marked that the limbs, feet and skin surface were often stone cold, whilst the internal temperature ranged from subnormal to hyperpyrexia. The loss of flesh following these attacks was often very marked and the convalescence a prolonged one.

Treatment, of course, consisted in restoration of normal functions as far as possible, but even in delirious cases the use of narcotics and sedatives was avoided, the depressing effect of such drugs on trophic nerve centres more than counterbalancing any benefit supposed to be derived from their soporific action.

SOME ASPECTS OF THE NERVOUS FORM OF DISTEMPER.

By A. J. WEIGHTON, M.R.C.V.S.
Hull.

WHEN application is made to text-books on this subject, for assistance in either diagnosis or prognosis, a dearth of information concerning symptoms which might be a guide is very noticeable, and this dearth has been a source of disappointment to, at any rate, one practitioner. An endeavour has been made to work out a suitable set of symptoms on which to base diagnosis and prognosis, these symptoms to refer chiefly to the nervous symptoms themselves and not to the well-known but sometimes misleading symptoms of pulse, temperature, etc. No claim is made that the methods presently described are perfect, and no doubt practitioners would rightly query some of the conclusions arrived at; they have merely served for some two years as a rough-and-ready clinical procedure, and it is admitted that they are constantly being altered as fresh experience is gained. The two manifestations of nervous distemper to be described are those of hysteria and convulsions. It has been found that these two have given the most anxiety in practice, both in diagnosis and treatment.

Hysteria is the name applied to a train of symptoms of nervous excitement held in common by a great variety of conditions, but referable chiefly to the

gastro-intestinal tract and the early stage of distemper. Hysteria is not confined to any one breed, sex or period of life ; some of the worst cases observed have been in mongrel terriers, usually the hardiest of the canine tribe, but it might safely be said that gun dogs on the whole furnish the most refractory patients in any nervous disorder.

The history of the attack is of great importance when a case is presented for diagnosis, as it is very seldom that a patient will oblige with a repetition of symptoms when in the surgery. The symptoms are characterised by their sudden and unexpected onset, the fact that their manifestation is always vocal in character, and that there is no loss of control over the limbs. Other symptoms which are of secondary importance are that the animal may rush wildly and aimlessly about, often very violently, especially when in a confined space, bears a strained and anxious expression, and has a far-away, silly look in the eyes. Other symptoms are shown in different cases, and vary accordingly. It is thus apparent that it is very easy to state that the patient is suffering from hysteria, but it is not so simple, but very important, to state the cause of the trouble and the probable final outcome of it. This last is of some moment to the poor or moderately well-off owner who cannot afford the money or the time to attend to an animal which has to be destroyed in the end.

The immediate cause is a hyperæmia of the brain ; it is seldom that this can be demonstrated actually. A number of cases have been made the subjects of post-mortem examination, having either died during the attack or been destroyed before the termination, and the results have been uniform in so far as a demonstration of hyperæmia is concerned. Hæmorrhage has never been seen. The post-mortems cover a period of three years and include dogs of all breeds to the number of forty-two. They were of all ages and both sexes, and though admittedly forming only a small proportion of acutal cases, were unselected and may therefore be taken as typical.

Hysteria may affect the old or the young dog. Any dog with a history of hysterical attacks of very recent occurrence, and which is under the age of three years, should have the temperature taken as a first move, as it is very likely that the hysteria is a precursor of distemper. This age limit of three years is an arbitrary one, no distemper hysteria having been observed beyond this age. The majority of cases have occurred in dogs between the ages of three months and two years, only eight being over the latter age. About 80 per cent. of cases developed typical distemper within periods varying from one to five days after the hysteria. Of these, the majority showed a diarrhœa, often transient in character, at the same time as the hysteria was noticed, but in some cases the only sign of anything abnormal was the high temperature. When hysteria is associated with distemper infection the temperature is always elevated to 105 degrees or more, and this breakdown in the heat-regulating mechanism probably accounts for the hysteria, though why it should do so in some cases of distemper and not in others is not known. A high temperature

coupled with hysteria is diagnostic of distemper in the dog of susceptible age, though the temperature must be taken while the dog is normal psychically.

As mentioned above, about 80 per cent. of cases developed typical distemper after hysteria; the remaining 20 per cent. were later cases, and it is considered that the use of the following method of dealing with them cut short an impending bout of distemper. Benefiting from the experience gained in the 80 per cent. of cases, a method was sought for which would cut short the distemper attack, and several were tried before any were found to answer. It was stipulated for any method that it should be rapid in action, safe and fairly simple to operate, and successful in at any rate 90 per cent. of cases.

Only one method of treatment was certain in results, namely, the use of hyper-immune serum, and this was employed in doses varying from 10 to 50 c.c. Probably the latter dose is too large, and while no ill-effects were noted from its application, nothing above 30 c.c. has been employed lately. The serum was injected subcutaneously, spreading the dose over a number of injections in different parts of the body, and given in this way proved quite efficacious. In five cases, however, intravenous injection was resorted to, as it was thought that other symptoms of distemper were developing—slight catarrh and conjunctivitis. The first six cases treated in this way are given below:

Patient.	Temperature. Degrees	Serum given
Setter, ten months ...	106.5	10 c.c.
	105	10 c.c.
	102	10 c.c.
Cross Terrier, seven months ...	106	20 c.c.
	101	*Nil*
	101	*Nil*
Spaniel, eighteen months... ...	107	40 c.c.
	102	*Nil*
	102	*Nil*
Spaniel, six months	105	10 c.c.
	105	20 c.c.
	101.5	*Nil*
Cross Alsatian, six months ...	105	30 c.c. intravenously
	104	20 c.c.
	102	*Nil*
Setter, twelve months	104	20 c.c.
	101	*Nil*
	101.5	*Nil*

It will be noticed that where the small dose was employed it had to be given on three days in succession. The setter given first was the first case treated, and it was evident that the dose employed was too small. The fifth case was one in which symptoms of catarrh were noticed, and for this reason the serum was given intravenously on the first day. By way of explanation, it should be said that the three temperatures and doses of serum refer to three successive days. Since these cases, about thirty-six others have been treated in the same way, and the results do not differ materially from those in the table.

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This type of hysteria furnishes a valuable symptom for the early diagnosis of distemper, since when present it is usually apparent before any other symptoms with the exception of the pyrexia. In itself it is of small consequence, it does not persist, and requires no special treatment. The owner may safely be assured that the dog can be completely cured with no fear of a recurrence. Hysterical symptoms may also be present at the termination of distemper proper. They are present at the commencement in some 20 per cent. of cases, and at or near the termination in about 2 per cent.

Of very different significance to the above type of case is the hysteria found near the termination of the disease. This makes its appearance while the patient is convalescing, usually at the very beginning of convalescence, and the lowness of bodily condition to be observed at this time is probably the main contributory cause. It must not be confused with the convulsions due to infection of the central nervous system; but as the symptoms of these are usually very different from those of hysteria, confusion should not occur. It is remarkable that in about thirty cases seen, all the dogs had become very low in condition, and that the owners, no doubt overjoyed that their pet had commenced to eat, had given them a large and substantial meal, very often of some tasty but indigestible foodstuff. So constant has this history been that the conclusion is forced that this is the exciting cause, and this form would therefore fall into the category of hysteria associated with gastro-intestinal disturbances. The distemper merely provides the contributory circumstance; but as distemper is almost the only debilitating disease after which this hysteria has been seen, it becomes a question of some importance in the consideration of nervous manifestations.

No useful treatment can be applied in these cases; every measure taken has been disappointing, and the best thing to do is to painlessly destroy the animal as soon as symptoms appear. This is not so much because the hysteria is very bad, though it may be so, or that it is continuous, but chiefly because the attacks will recur within short periods and that the dog seems permanently silly between attacks. No single case seen has ever made a useful recovery. Prevention would seem to consist in providing a light diet during the convalescent period.

Perhaps the most disappointing cases of distemper are those which develop convulsions due to infection of the brain and spinal cord. Quite a number of cases will recover, but when recovered are so afflicted as to be objects of pity which one cannot but feel would have been better dead; others, again, will make quite a useful recovery.

There are two types of cases, namely, those associated with cerebral disease, and those associated with cerebellar disease. In those cases associated with cerebral trouble the symptoms take the form of convulsions. Unless otherwise stated, the following remarks apply to nervous symptoms developed initially or very early in the course of distemper.

In those cases which develop convulsions four phases may be recognised: firstly, a preconvulsive state; secondly, a state in which a certain group or

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groups of muscles begin to contract involuntarily with a clonic twitching motion ; thirdly, a state in which these twitchings spread to affect other parts of the body and lead to a climax ; and, fourthly, a state in which the twitchings die down and a return to quiet is seen. The first two are the most important for diagnostic purposes, the third is the true convulsive state, and the fourth may be absent altogether in those cases where the fits follow one another very rapidly. With this exception, all phases can be recognised in fits which are due to distemper. Other points of differentiation between fits due to distemper and those due to other causes will be indicated as each set of symptoms is described. Associated with these convulsions are certain other symptoms which vary with different cases, such as howling or hoarse barking, excessive slaver and great irritability.

The first point of importance is the interval in time between successive attacks, and this is usually the first point which an owner makes when describing symptoms.

A short interval is to be regarded as very serious, short being considered as anything under one hour ; in some the interval is absent altogether. In these the animal is practically in one long continuous fit. This latter is, however, not common, twelve cases only having been seen within two years. Of these twelve, two were treated at the express wish of the owner, but their course was entirely unaffected by any therapeutics, and they died after the lapse of two days and a week respectively. The case lasting one week lapsed into coma for the last three days. The symptoms noted were those of convulsions, the involuntary twitchings affecting the whole body, and so continuous that it was impossible to say in what particular group of muscles they started. All control of fore and hind limbs was lost, the animal being quite unable to stand even when propped up, and control of the sphincters of the anus and bladder was also absent. A constant foam appeared at the mouth, blood-stained through biting of the tongue, the jaws champed constantly and with a curious shuddering motion ; the conjunctiva was of a dark-red colour, as also was the membrane of the mouth ; the pulse was faster than normal (90 to 120), but almost imperceptible to the touch, and the reflexes were absent altogether.

Increased irritability was not seen in any one of these twelve cases, in fact in several an anæsthesia of head and other parts was noted. All these factors pointed to a sudden, rapidly increasing and dangerous inflammation of the brain, and this being so, the majority were destroyed there and then. Certainly these are quite hopeless cases, and should all be dealt with in this way.

Sometimes the interval is fairly long at first and gradually or suddenly becomes short, and if this is so the case is again hopeless, but there are usually certain warning signs of this state of affairs. It will be found that in fits which are due to distemper there is a certain regularity about the interval. When it shortens it does so in a progressively regular manner, unless, of course, it shortens very suddenly.

The preconvulsive state is that marked by certain psychic disturbances, and is present in all convulsions, however caused. It may be long or short, sometimes

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extending over several days, and sometimes lasting only a few minutes. It is characterised by a variety of symptoms, including dulness (often with inappetence), increased irritability, changes in fixed habits, and changes in the expression of the eyes and movements of the eyeball, and state of the pupil.

Dulness, whether or not accompanied by variation in appetite, is not typical of distemper convulsions, especially if it is accompanied by anæmia of the mucous membranes and a dilated pupil. Increased irritability or hyperæsthesia, when accompanied by either a contracted pupil or one which varies over short periods of time, is highly suggestive of distemper. This hyperæsthesia usually applies to the centres of hearing and sight, both of which are involved, and, so far as can be ascertained, to an equal degree. Increased irritability has been noticed in all cases of distemper convulsions which arise early in the course of the disease, and while it may vary in degree in different dogs according to temperament, as a general rule one may say that the greater the irritability the more serious the ensuing fits are likely to be. A general rule for all dogs is very difficult to lay down, since the nervous spaniel cannot be judged by the same rule as the placid bulldog. In the Labrador, which is a remarkably docile dog to handle, nervous symptoms seem rather common, and valuable guidance can be obtained from a study or description of the preconvulsive state.

The expression in the eyes is another important symptom to be assessed with hyper- or hypo-æsthesia. Patients which have a sidelong glance constantly fixed on the observer (looking out of the corner of the eyes), or those which look him full in the face, but not for long, and without apparently seeing him, can be regarded as unsatisfactory, especially if these symptoms are accompanied by a peculiarly wild and staring expression. When a patient is dull, with dilated pupils, a dull eye expression, one can safely assume that the trouble arises, not from distemper infection, with resultant active brain hyperæmia, but from a venous congestion referable to some non-contagious disease. A peculiar symptom has been noticed in three dogs, namely, a peculiar rolling of the eyeball, which gave the dog a most extraordinary appearance. It has also been noticed in dogs not suffering from distemper, but with this difference, that in distemper both eyeballs rolled, and in other cases only one. If not pronounced it might be mistaken for squint, but close observation will demonstrate the rolling movements. A very uncommon symptom, when present it is diagnostic of incurable brain trouble.

Changes in habits are rather unreliable guides, since the owner's account cannot be checked or substantiated, and sometimes proves quite unfounded.

The convulsive state itself becomes most important in those cases which have had distemper and develop fits at a late stage or when apparently recovered, and for purposes of prognosis it is desirable to localise the group of muscles in which twitchings start. In continuous convulsion this cannot be done, and these conditions must be assessed as described previously. It is typical of a convulsion that it should start in a relatively small area and spread over the body in waves,

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with an after rigidity, or tonic contraction, and quiet. This is not true of distemper convulsions. They seldom arise in a small area, never extend over the body in waves, and do not include any after rigidity. Typically a distemper convulsion arises in several areas, usually the head, jaws and neck, though exceptionally it can be seen to start in one group of muscles, such as the lips or eyelids. If other parts of the body are affected it is in a quite irregular fashion, starting in many along with the head symptoms, and in some the movements are possibly voluntary. A great number of cases have only one set of muscles affected throughout the convulsion, and in these the muscles are invariably the head ones.

In an attempt to localise the centre from which the convulsions are proceeding, considerable help can be obtained from a physiology text-book, with illustrations of the governing centres of the brain. The centres for the anterior limb and the neck are close together, those for the posterior limb behind these, and those for the facial muscles behind these.

There are four types of convulsions, with slight variations. In the first, the jaw muscles only are affected, there is copious salivation, not infrequently blood-stained, and the animal retains control of gait and consciousness. These convulsions are certainly among the least hopeful ; firstly, because they usually spread up the head to finally involve the facial and eyelid muscles ; secondly, because the interval is short or absent altogether ; and, thirdly, because the pre-convulsive state is prolonged and includes some of the worst symptoms described under that heading. This type is seen late in the distemper attack, and if recovery occurs the dog is an idiot, a rather strange termination in view of the fact that consciousness is not affected during the fit.

The second affects the whole of the head and face from the start, and not infrequently involves the neck as well. This is the sudden and extreme form referred to when discussing the interval, and as pointed out there, is primary and fatal Should the head and face symptoms be slight and the convulsion chiefly affect the neck and fore limb, the outlook is decidedly better. The symptoms shown are champing of the jaws with some salivation, and twitching of the neck and arm or shoulder muscles, the twitching of the limb being pronounced, with strong movements. Consciousness is never completely lost, though owing to the recumbent position this often appears to be the case. The reflexes, however, are present, and the sight and hearing usually retained. The fit is ushered in by a very short preconvulsive state, which may be only a matter of seconds, and the convulsion itself a matter of a minute or two. The period of recovery is comparatively long, and this type seems to weaken the animal more than the serious and fatal types.

A fourth type of fit affects the limbs and the neck muscles, variations seen being an absence of neck spasms, or localisation in only one pair of limbs, though when the fore limbs are affected the neck is invariably also. This type is very uncommon, and when encountered can be looked on as a mild form, which really only requires time and good nursing to effect recovery. It is the only

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one in which anything approaching to rigidity has been observed, the convulsive muscular contractions being prolonged and approaching the tetanic in character, and can be distinguished from chorea by the fact that all four stages of a typical fit can be readily observed. This type, as well as the previous one, is very weakening in after effects. While not concerned with treatment here, it may be mentioned that the more attention that is paid to this characteristic of the last two types of fits the more encouraging will be the results.

Apart from these four main types, the only other set of symptoms which are of importance are those connected with the optic nerves and with the cerebellum. Strictly speaking, the optic nerve lesions should be considered under the heading of hyperæsthesia, but they are of such importance that they merit discussion on their own. Blindness, unaccompanied by any discoverable lesion in the eye, is serious enough in itself, but when it arises during the course of distemper its importance must be assessed in accordance with other brain symptoms which are present, since certain cases make partial recovery. These recoveries cannot be said to be complete, as the sight is always impaired to some extent, though often a casual examination will not betray any appreciable departure from normal. The first two types of convulsions described are those which often have blindness as an accompanying symptom.

In these very acute cases arising primarily or very early during distemper it is difficult to say whether blindness is present or not, as the patient is in the throes of convulsions practically continuously. It is safe to assume the absence of sight, no reflex being obtained from sudden bright lights or other means, and in any case the question is of small moment in view of the gravity of the other symptoms. Apart from these, amaurosis has been noted in connection with the later stages of encephalitis or cerebellar disease developed late in the course of distemper. These later convulsions are generally of the first type, and when accompanied by blindness are hopeless; even if the convulsions are cured complete blindness is left as a sequel. In some cases retinitis is the cause, but the majority will show a brain lesion on post-mortem. Amaurosis may also be observed in fits of the third type, in which case it may be complete or only partial. Partial amaurosis is usually observed; it is also very often intermittent in character, at any rate in the early stage, and its presence does not materially increase the gravity of the case. When partial or intermittent it will usually clear up under appropriate treatment; but the treatment must be special, as if left to itself while the fits are treated with sedatives, etc., a permanently blind dog will be the end result.

Probably the majority of cases of blindness are associated with cerebellar disease. This is easily diagnosed, and only a brief mention will be made of it. The symptoms are well known: a rolling or staggering gait, walking round in circles till the dog falls over, and walking backwards or turning on a short axis. Perhaps the most constant symptom is that when the animal is stood against a wall with the forehead pressed against it, it seems unable to move away or

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voluntarily to slacken the pressure until forcibly removed. Cerebellar disease is seen in the later stages of distemper, usually after a mild attack ; it is almost invariably associated with blindness, probably from pressure of exudate rather than extension of the inflammation, and, last but not least, is not worth while treating.

Mention has been made of the reflexes, of which the most important are the patellar, the conjunctival and the pupillary. Their presence or absence has already been alluded to. The patellar reflex is obtained by laying the dog on the side and grasping the upper hind leg by the thigh, the leg being slightly flexed. A sharp, light blow is made on the patellar ligament and normally the quadriceps muscle makes a sharp contraction, almost instantaneously. It is more reliable than the conjunctival reflex or the reaction of the pupil to light, as these two are also influenced for psychic reasons. The pupillary reflex is very helpful to confirm a diagnosis. Myosis is more common in fits due to distemper, though the pupil may vary considerably, and it is usually dilated during the actual convulsion. In the preconvulsive state, however, it is nearly always contracted. These reflexes, and especially the patellar one, are very much diminished in an acute and rapidly increasing inflammation, and are usually increased in the more chronic forms, but in these latter may be almost normal, with the exception of the pupillary.

Summary.

Diagnosis.—Distemper convulsions may be distinguished by the following facts : The first three phases of a convulsion can be separately recognised, and the interval is always regular—even if becoming shorter, it shortens with a regular progression. The preconvulsive state is marked by increased irritability, a contracted or varying pupil, a peculiar wild expression, and diminished reflexes. The convulsions themselves arise in several areas or a fairly large area, do not extend over the body in waves, and include no tonic contraction. Non-nervous symptoms which are sometimes but not invariably noted are pyrexia, diarrhœa and catarrh. In addition, the age of the dog furnishes some help. Convulsions occurring late in distemper should present no difficulty, as the history of the case is available.

Prognosis.—A hopeful prognosis may be given where the intervals are long or becoming longer ; where the preconvulsive state is marked by slight irritability and slightly abnormal reflexes, and, where the convulsions are of the last two types described, leave some degree of weakness on the return to quiet ; and where blindness, if present, is partial or intermittent. Cases are hopeless when the intervals are short or practically absent, or becoming progressively shorter ; when the preconvulsive state is long, shows great irritability, diminished or absent reflexes, the staring expression already referred to, a rolling of the eyeballs, or blindness ; when the convulsions fall within the first two types, show a tendency to be confined to or chiefly affect the head muscles, and where the mucous membranes are cyanotic.

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In conclusion, it may be stated that the above observations are the result of several years of careful tabulation of symptoms and following up of cases. They are essentially used to make the reasonably rapid and practical advice necessary in a busy practice, and represent the fruits of experience of over fifteen hundred recorded cases.

A STRANGE CASE.

By A. C. SHUTTLEWORTH, B.V.Sc., F.R.C.V.S.

Department of Veterinary Anatomy, University of Liverpool.

A PUZZLING case with a strange solution was presented to the University Veterinary Hospital some months ago. The animal in question was a two-year-old Airedale dog. He was a fine healthy specimen of the breed, and had been in the possession of the owners since puppyhood. A few weeks before entering hospital an abscess had appeared in the left sternal region. This was opened and dressed by the practitioner. The discharge of pus had persisted and a sinus was formed. Other abscesses followed by sinus formation had occurred.

When the animal was first examined in consultation the left breast and axilla were pitted and scarred by several profusely discharging sinuses. Preliminary probing showed the sinuses to be directed towards the lower part of the fourth or fifth intercostal space. A later examination under a general anæsthetic, with generous opening of the sinuses, demonstrated the pus channel entering the chest cavity through the lowest part of the fourth intercostal space. It was a large opening, but digital examination along its track gave no information.

An X-ray photograph of the chest was inconclusive, but the radiologist suggested that a shadow on the arch of the fifth rib was possibly an old fracture with necrosis of the bone. The pus then burrowing between pleura and rib to emerge at the lowest part of the intercostal space. This warranted an investigation of this area. Operation upon the rib showed no roughening, callus formation or other abnormality upon the external face of the rib. Internally, by palpation through the intercostal space, neither the suspected rib nor its neighbours gave any information of disease of the thoracic surface. The wound was closed with no progress made. An examination of the lower opening as far as was judicious was similarly barren.

To be brief, several more X-ray photographs and exploratory examinations were made without result. Later the dog was destroyed.

Post-mortem showed that the whole of the thoracic wall was normal, but impacted along the floor of the chest cavity, between the sternum and the transversus thoracic muscle, parallel to the long axis of the body, lay a wooden meat skewer more than five inches long. So firm was it in its bed that instruments were used to withdraw it. It lay rather on the right side of the thoracic cavity than the left. From this source the pus originated. A strange object to find

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so snugly hidden, but not so strange as the complete lack of any history of its reaching this position.

The owners were insistent that he had never had a day's illness, had never been away from home, and had never shown any signs of injury or pain whatsoever. This is difficult to believe, knowing its only means of reaching the cavity. It may have been swallowed and penetrated the œsophagus at the entrance to the chest. It may possibly have travelled forward through the stomach wall and diaphragm. No scars of entrance were found at either of these points.

The most feasible supposition is that the dog ran into the skewer and drove it through the entrance to the chest cavity at the base of the neck. The force necessary to drive a blunt wooden instrument to such a depth would be very great, and it must have been driven through at one blow. Alternatively, the skewer having partly entered the chest may have been rubbed deeper by the animal's attempts to extract it. A portion of the skewer may have been bitten off, while the remainder became enclosed by the tissues.

The good fortune of the dog in escaping immediate death from injury to the vessels emerging from and entering the chest at this point is obvious.

STRYCHNINE POISONING.

By CLIVE POTT.

Royal Veterinary College, London.

THIS case occurred whilst I was acting as *locum tenens* for Mr. D. E. Wilkinson, M.R.C.V.S., Chigwell.

The subject, a black cocker spaniel, was in perfect health until taken out for a short walk on the evening of November 15th last. He was not observed by his owner to pick up anything whilst out, but as the evening was very dark he evidently did so unobserved. Half an hour later as he lay in front of the fire he began to twitch violently, and as these symptoms increased in intensity his owner rang up for attention, saying the dog was in a fit.

On examination he presented all the indications of poisoning by strychnine: opisthotonos, persistent tonic and clonic spasms, which were markedly increased in intensity by the sound made when his owner moved the table to enable me to get a better view of him.

Apomorphine hydrochloride (gr. $\frac{1}{8}$) was at once administered hypodermically, and was followed in a few minutes by vomition of food and frothy mucus. This was followed by an intraperitoneal injection of nembutal. Judging the weight at 30 lb. and apportioning the dose at one-fifth grain per pound body-weight, a dosage of six grains was administered. Seven minutes after the administration of this drug the convulsions had almost entirely ceased, and in about fifteen minutes later the dog was deeply narcotised. He was then warmly clad and placed in a basket before a hot-water boiler.

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The owner and his wife, who sat up all night with him, reported next day that the dog, about 5 a.m., recovered from the narcotic, and that all convulsive movements had ceased. On visiting him at 11 a.m., the only unusual symptom to be observed was an occasional slight inco-ordination of movement of the hind limbs. Further treatment consisted in the administration of acid acetyl. salicyl., gr. 5, in mucilage three times that day. On the following day recovery was complete.

ENTAMŒBA HISTOLYTICA IN DOGS.

By Z. MORCOS, F.R.C.V.S., M.V.Sc., D.V.H.
Veterinary School, Faculty of Medicine, Cairo University.

Literature.

THE undermentioned authors reported the following :–

[1] Wenyon : Losch (1875) succeeded in infecting a dog with *E. histolytica*. Hlava (1887) was the first to produce infection in young cats. Kruse and Pasquale also infected cats with the amœba obtained from liver abscess.

[2] Wooldridge : Spontaneous amœbic dysentery in dogs has been described in Egypt (Kartulis, 1891, 1913).

[3] Hutyra and Marek : Amœboid dysentery can be produced artificially in dogs and cats.

[4] Bigger : Dysentery may be produced in young cats and dogs by feeding with material containing the cysts, or more certainly by injection of such material into the rectum.

[5] Gaiger and Davies : *E. histolytica* has several times been observed as the cause of dysentery in dogs and also been recorded as the cause of liver abscess in the dog. A case is on record of natural infection in the cat. Experimentally, young cats, guinea-pigs, rabbits and rats may be infected.

[6] Hans Zinseer : Young dogs appear to be readily infected and in them amœbiasis may occur spontaneously as the result of coprophagus habits. Monkeys and orang-utan also develop typical amœbiasis spontaneously.

Cases Met With.—Dogs suffering from diarrhœa or wasting were always examined for worms or any parasitic alimentary trouble, and since 1929 only five cases were established, three at Giza, one at Kobba, and the fifth at Heliopolis. The fæces of the five dogs were found watery and tinged with blood. Microscopic fresh preparations revealed vegetative forms of *E. histolytica*, and no cystic forms were at all seen. One of the three cases of Giza was treated by my colleague, Dr. Rushdy with three successive subcutaneous doses of 0.03 gram emetin, after which the case recovered and was discharged. The last two cases, at Kobba and Heliopolis, were given Yatrin pills 105, two daily for ten days, after which the dogs resumed normal life.

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REFERENCES.

[1] C. M. Wenyon : " Protozoology," vol. I, p. 203.
[2] G. H. Wooldridge : " Veterinary Medicine," p. 273.
[3] Hutyra and Marek : " Pathology," vol. ii, p. 546.
[4] J. W. Bigger : " Bacteriology," p. 428.
[5] Gaiger and Davies : " Veterinary Pathology and Bacteriology," p. 311.
[6] Hans-Zinseer : " Bacteriology," p. 906.

AN OBSTRUCTION OF THE ŒSOPHAGUS.

By R. HUDSON, F.R.C.V.S.

Retford.

THE subject was an Aberdeen terrier.

History.—The animal had seized a piece of mutton-chop bone, and on the owner attempting to take it from him he had promptly bolted it. There immediately appeared symptoms of distress and attempts to bring it back. These subsided, and for some days he could swallow liquids, but when soft solid food was taken he brought it back, though he sometimes retained it for about an hour. The ability to swallow liquids delayed the operation, for it led to the belief that the bone had passed the œsophagus and that only injury and swelling remained.

Eventually, after six days, he refused all liquids and appeared to be very ill, so I was consulted. Passing an œsophageal sound, the bone was found to be still in the œsophagus, and near the stomach entrance. It was decided to operate on him. Gastrotomy was carried out, and with a finger in the stomach I searched for the œsophageal opening and foreign body. Big as it was, it was not easy to get at, I think because a bulging of the end of the œsophagus was present forcing it towards the vertebral column. However, I eventually located it and applied a pair of curved abdominal forceps. It was held very firmly, and the forceps slipped a time or two, but by trying to work my finger along the œsophageal margin and exerting gentle traction on the bone I was able to withdraw it.

The stomach and abdominal walls were sutured in the usual way, and the patient made comfortable for the night, but he died the following morning.

Post-mortem Examination.—On opening the chest a large quantity of septic fluid was found. An abscess had formed in the wall of the œsophagus and burst into the chest cavity. The abscess lining was necrotic. A small hole, evidently where a point of the bone had penetrated, was present in the lining of the œsophagus. No fresh damage appeared to have resulted from the extraction of the bone. The abscess may have burst during the operation, or, as I am inclined to think, on the morning of the day I operated, because it was then that the dog became very ill. It is evident that such cases must be operated upon without delay if a favourable result is to be expected.

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Reviews

Agricultural Statistics, 1934. Vol. LXIX, Part I. His Majesty's Stationery Office. 1935. Price 1s. 6d. net.

VOLUME LXIX, Part I, of the 1934 Annual Report on Agricultural Statistics, which has just been issued by the Ministry of Agriculture and Fisheries, contains many facts of lively interest to the practising veterinarian, and amongst others, too, for the student and the parent whose son is considering the question of entering the profession. Commencing with a summary of the acreage of land devoted to the growing of crops of corn, potatoes, sugar-beet, hops, fodder roots, it gives details of such table vegetables as cauliflowers and Brussels sprouts used for human consumption, apples, stone fruit, strawberries, etc., and carefully compiled statistics of the numbers of cattle and other agricultural animals. Although there is a slight diminution in the number of horses (17,024), it is good to read that the record number of cattle returned in 1933 increased by 40,000 to a new record figure of 6,660,155 in 1934. The total dairy herd, too, has increased to 2,995,000, which is also 40,000 (1 per cent.) more than in 1933. The census of the sheep revealed a reduction in numbers of more than 1½ millions, the total of the figures returned being only 16,527,000; the number of breeding ewes being reduced from 7,768,000 to 7,308,000; and in the general total of all classes there was a reduction of 32 per cent. on the number returned for the previous year. Pigs numbered 3,320,000 in June, 1934, this being 251,000 more than in 1933. Of these, 450,000 were breeding sows, an increase of 11 per cent. There were still 886,000 horses, but those kept for agricultural purposes (596,000) were fewer by 49,300 (8 per cent.) than in 1933. Stallions increased in number (26,000) from 3,800 to 5,300, and other horses were 26,000 (20 per cent.) more than in 1933. Fowls, whose economic place in agriculture is now a permanent and very real one, increased to 61,330,000, of which 27,890,000 were over six months old, and 33,440,000 under this age when the census was taken in June; the actual total increase being 159,000 (0.3 per cent.). Ducks had been reduced to 2,452,000, and geese 650,400, about 10,500 less than in 1933. Turkeys, too, were down about 23,000, even Norfolk (so celebrated for the quality of these birds) being down some 79,600. With the exception of the pig, the numbers of the food animals sold for slaughter direct off the farm had increased satisfactorily, except in the case of the pigs, which were down some 220,000. The total production of milk was estimated at 1,379 million gallons for the year ending May, 1934, an increase of over 30 million gallons more than in 1932–33 and 116 million gallons than in 1930–31. There are many other details of interest to the veterinarian which make the book worthy of a place on the reference bookshelf.

A MERCIFUL MAN IS MERCIFUL TO HIS BEAST.

RESOLUTION passed at a full meeting of the Central Branch of the National Veterinary Association, January 16th, 1936:

"That on grounds of common humanity the animals of the poor, when sick and in pain, are entitled to have proper diagnoses and treatment of their illnesses by veterinary surgeons, just as much as the animals of the rich; and that it is inhumane that they should be experimented upon by unqualified persons."

ERRATA.

IN our issue for December, 1935, on page 539, Mr. F. H. Manley, M.V.Sc., M.R.C.V.S., was referred to as the late Chief Veterinary Officer for the Government of Cyprus. We have been asked to state that Mr. Manley's post was that of Veterinary Officer.

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